

**\$6,000
Game Contest!**

June 1983

\$2.95

Color Computer

MAGAZINE

For TRS-80™ Color Computer & TDP-100™ Users

Game Programming Contest

**Jake Commander's
Color Disassembler**

**Dennis Kitz's
Banner Display**


**John Barden Jr.
Animation**

**Graphics
Computer Clubs**

Excerpt from
***The Restaurant at the End
of the Universe*** by Douglas Adams



*™ Tandy Corporation

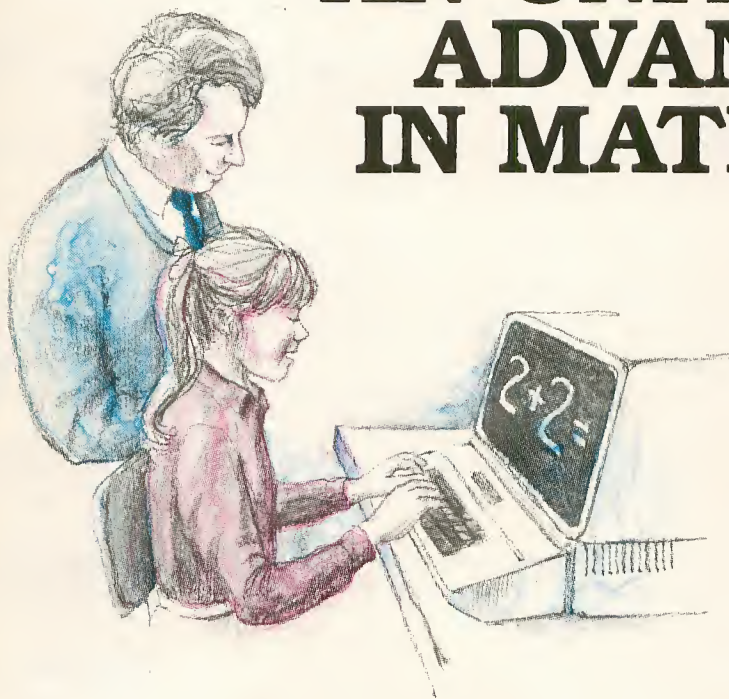


GUARANTEED TOUGH.

**LEADING
EDGE.**

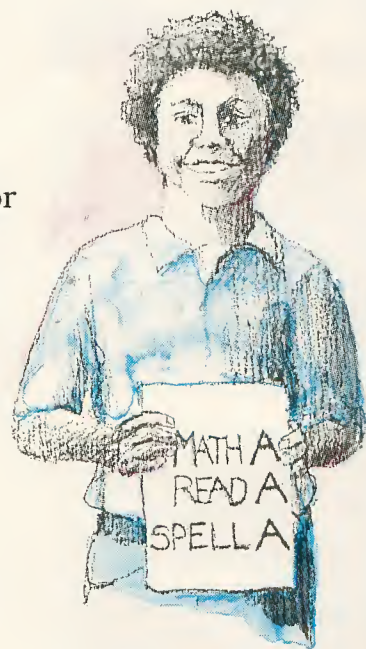
225 Turnpike Street, Canton, Massachusetts 02021
Toll-free: 1-800-343-6833; in Massachusetts (617) 828-8150. Telex 951-624. *Circle No. 1 on Reader Service Card*

GIVE YOUR CHILD AN UNFAIR ADVANTAGE IN MATH



Help your child gain an advantage by using one of our classroom-tested programs in number concepts, addition, subtraction, multiplication, division, fractions, decimals & percent, pre-algebra, or one of the 15 math games that teach.

For students in grades K through 9, on tape or disk. For TDP and TRS-80 32K Color Computers with extended basic. These professional-quality programs use high resolution graphics with text and sound. They have been written by experienced teachers, tested and revised to provide high-quality and highly motivating instruction. And while you are asking, ask to see our reading and language programs as well.



**ASK FOR MICRO SCHOOL
PROGRAMS BY NAME at your
local computer store.**

BERTAMAX INC.
Max Jerman, Ph.D.,
President



PERSONALIZED INSTRUCTION ON PERSONAL COMPUTERS

THE Color Computer... MAGAZINE



p. 40

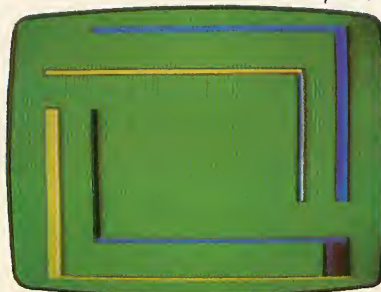


p. 80



p. 82

p. 89



FEATURES

16/Summer Programming Project

(Contest)

We challenge you to write a game this summer and win a cornucopia of Color Computer prizes.

19/Computer Club Primer

by Shawn Jipp

(General)

How to organize the Color Computerists in your area into a Users Group.

26/Math Drill

by James Sanford

(Education)

This program will teach math to students of different grade levels.

30/How to Shop for Equipment

by Keith Baker

(General)

Avoid costly mistakes by applying smart shopping awareness to your computer purchases.

32/Color Animation

by William Barden Jr.

(Graphics)

Part I showed you how to animate in Basic. This final installment applies the techniques to machine language.

36/How to Write Good Documentation

by Kathleen Gill

(Tutorial)

Adventure International's documentation writer Gill explains the do's and don'ts of writing program documentation.

40/The Restaurant at the End of the Universe

by Douglas Adams

(Fiction)

Chapter three excerpted from the second book of the best-selling science fiction trilogy, *The Hitchhiker's Guide to the Galaxy*.

46/Custom Color

by Dennis Kitz

(Graphics Utility)

Create a neat, clean, scrolling display for your store, school, home, or just to show off your computer.

60/Sweet Add-A-Line

by Richard Ramella

(Home Management)

Make itemizing shoebox-stored receipts easier using this personal accounting program.

64/Rectangles

by Lynn Davis

(Graphics)

Teach your computer to doodle.

68/Color Disassembler

by Jake Commander

(Utility)

Assembly-language programmers rejoice, here's a disassembler just for you.

DEPARTMENTS

4/PEEK (06,83)

10/INKEY\$

Letters from our readers.

74/REVIEW\$

Part II of a guide to smart terminals, Sea Dragon, two replacement keyboards, Silly Syntax, and more.

92/NEW:PRODUCT\$

96/END OF FILE

Fort Worth, Texas. Come on down.

64/FOR...NEXT (07,83)

Cover

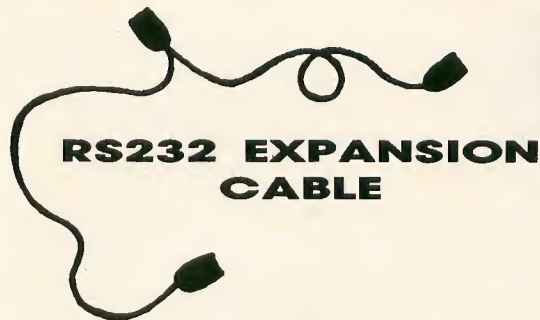
A Cup of Tea, a Heart of Gold, and a Vagon Lemon by William A. Giese.

THE COLOR COMPUTER MAGAZINE is published monthly by New England Publications Inc., Highland Mill, Camden, ME 04843. James S. Povec—President, Michael Perlis—Executive Vice President, H. John Delile—Treasurer

Subscriptions are \$24 for twelve issues. User Group subscription rates available. Outside U.S.A. add \$10 for extra postage.

POSTMASTER: Please send changes of address to The Color Computer Magazine, P.O. Box 468, Hasbrouck Heights, NJ 07604. Application for mailing at second class rates pending at Camden, Maine, and additional mailing offices.

Tired of plugging and unplugging devices from the RS232 port of your Color Computer? Make your life easier. Buy our RS232 expansion cable and connect two devices at the same time. Just right for printers, modems, etc. Anything that plugs into the Color Computer will plug into this high quality cable.
RS232 Cable \$20.00



RS232 EXPANSION CABLE

COLORCOM/E BONUS! Order COLORCOM/E and get the RS232 cable for only \$15.00. Save \$5.00

32K RAM Button _____ \$2.99
 Nanos System Reference Card _____ \$3.99

SPECTRUM PUTS THE SLAM ON RAM

16K Chips _____ \$12.00/set
 64K Chips _____ \$49.95/set
 Basic ROM 1.1 _____ \$36.00
 Disk ROM _____ \$39.95
 6883 (SAM) Chip with heat sink _____ \$29.95
 6809E _____ \$29.95
 CoCo First Aid Kit (Be Prepared)
 (2 6821s, 6809E, & 6883) _____ \$69.95

Color Computer Tech Manual _____ \$7.95
 Epson Printer Interface (Serial I/O Port) _____ \$49.95
 Lowercase Kit _____ **ONLY** \$69.95
 12 Key Numeric Keypad _____ \$79.95
 Extended Basic ROM Kit _____ \$88.00
 64K "E"/"F"/TDP Board Upgrade _____ \$99.95*
 RS Disk Interface (with manual) _____ \$179.95
 Epson MX-80 w/CoCo Interface _____ \$499.95
 *FREE Return UPS Shipping

STINGER IS HERE! The ultimate maze game.
Cassette \$24.95 Disk \$29.95 ROMpak \$34.95



COLORCOM / E

SMART TERMINAL PACKAGE

WE DIDN'T WAIT for the competition to catch up with us! We've added even MORE features to COLORCOM/E, our superb Smart Terminal program for the Color Computer. Compare before you buy. NOBODY offers you more!

- ★ Complete Upload and Download Support
- ★ Online Cassette/Disk Reads and Writes
- ★ 110, 300, 600, or 1200 Baud
- ★ Full or Half Duplex
- ★ Preenter Data Before Calling (Saves \$\$s)
- ★ Offline and Online Scrolling
- ★ Automatic Capture of Files
- ★ Send All 127 ASCII Characters From Keyboard
- ★ Word Mode Eliminates Split Words
- ★ 7 or 8 Data Bits (Including Graphics Support)
- ★ Efficient Data Storage S-t-r-e-t-c-h-e-s Memory
- ★ ROM Pack or Disk

COLORCOM/E \$49.95

AND, our efficient storage and easy editing of received data makes printing to your printer offline a snap. Select any portion of the received data for printing. No need to print everything.

Add \$2 for Shipping and Handling

1. 40K—Tired of seeing 22823? A ?MEM now returns 31015 with four pages for graphics! ***
2. Software Print Spooler—Tired of waiting for your printer? You can now output data to a RAM buffer at high speed and go back to programming while your

64K DISK UTILITY PACKAGE

data is being printed simultaneously on your printer! Works with printers that accept 1200 baud.



SPECTRUM PROJECTS

93-15 86th DRIVE
 WOODHAVEN, N.Y. 11421
 (212) 441-2807 (VOICE) (212) 441-3755 (DATA)

New York State Residents add appropriate taxes

DEALER/CLUB INQUIRIES WELCOME

3. ROMCRACK—Now you can place your ROM PAC software on disk! ROM-CRACK can make most ROM PAC software work on your disk _____ \$21.95
 *** Available on cassette tape by itself for \$9.95. Half-price when ordered with Spectrum's 64K chips!



we had a lot of fun putting this month's issue together. The idea for the Summer Programming Project came on a day when the clouds were grey, the temperature was below freezing, and we needed something to put our frame of mind ahead to the summer.

The Summer Programming Project blossomed from a winter-depressed attitude idea to a full-blown contest because of the enthusiastic way in which our advertisers responded to it. Most of them gave the idea a few seconds' thought before offering their share of the winner's purse. In all the prizes total over \$6,000. There will be six winners. All you have to do to win is come up with an original Color Computer game and send it in to us before the end of the summer — Labor Day, September 5, 1983. GOTO 16 for all the particulars.

New this month is our INKEY\$ department. INKEY\$ is our Basic language way of saying Letters to the Editor. Boy did we get a lot of mail. Thanks for letting us know how much you've enjoyed **The Color Computer Magazine**. Some of those letters are excerpted in INKEY\$'s debut, GOTO 10. When writing to us use the Camden, Maine address found in the small print under the Table of Contents. All letters will be considered okay to publish unless you specifically state otherwise.

It seems that TRS-80 owners band together into Users Groups more than owners of any other microcomputer system. Color Computer Users Groups are springing up all over the place. These groups are good ways to meet other Color Computerists and share ideas on how to better use your computer. They're also a good way for beginners to get help from more experienced users, and for advanced users to meet others on the same level. GOTO 22 for Computer Club Primer where Shawn Jipp, of the Silicon Valley Users Group, explains how to get your Users Group started.

We sent freelance writers Tim and Debra Cole to a meeting of the Color Computer Club of Youngstown, Ohio. Next month they'll report what goes on at this one particular club's meeting.

GOTO 26 where Lynn Davis offers another of his graphic wonders. This time around Lynn uses a small routine to draw random rectangles on your video display. The program is one of those that never end, it'll draw colored rectangles seemingly forever — a nice program to use to show off your Color Computer to your friends.

What's the first thing you did after taking your first Color Computer out of its box? Well power it up of course. But I mean what's the first thing you do after you've done most of the normal first things? What I'm getting at is the lust for more equipment. The first thing I did was try to figure out where the money for a printer, disk drives, a modem, and the long long list of software I wanted would come from.

Keith Baker, like most of us, went through the I-want-everything phase when he first bought his Color Computer. And, like most of us, he learned that amongst the many fine peripheral vendors there are a few bad and unscrupulous people out there. His article, Peripheral Buying (GOTO30), is intended to help keep the new computer owner from also getting burned.

William Barden Jr. finishes his graphic exercises in Color Animation — Part II. GOTO 32 to learn how to apply the Basic techniques Bill showed you in Part I to machine language.

Many people buy their Color Computer hoping to learn programming well enough to make money from writing

software. With the computer-boom being so widespread there are a lot of opportunities if you apply yourself to the task. Once you've written that program of programs, the job is only half finished. Now you've got to write its documentation.

You may think that that's the job for the software house. Well that's as right as it is wrong. GOTO 36 for a lesson in writing documentation by a documentation pro. Kathleen Gill is a documentation writer for Adventure International. She explains the importance of good documentation and how to go about writing it. Many of the principles she discusses also apply to magazine articles. So even if your program publishing plans go no further than magazine articles, do give Kathleen's article a good read-through. A program is never any better than its documentation.

The Hitchhiker's Guide to the Galaxy first appeared as a radio play on the BBC in England. Success brought it to public radio in America. Further success made it possible for the book's author, Douglas Adams, to transform the radio scripts into a book. Even more success prompted the writing of more radio plays and then a second book, *The Restaurant at the End of the Universe*. Not long ago the third book of this humorous science fiction trilogy came out called, *Life, the Universe and Everything*.

For a few weeks all three books simultaneously entrenched themselves on *The New York Times* bestseller lists. *Life, the Universe and Everything* enjoyed a few months on the list. The books begin with the destruction of Earth to make way for intergalactic space bypass. You see Earth is in the way and it's just not economical to detour around it. Arthur Dent, because of his friendship to the well-known intergalactic hitchhiker Ford Prefect, is saved from Earth's destruction by thumbing a ride with Ford, on a spaceship.

The story travels the galaxy. The books are such fun reading that we decided to include a chapter in this issue. Our excerpt (GOTO 40) is chapter three from the second book, *The Restaurant at the End of the Universe*. In chapter two Arthur Dent has the computer onboard the Heart of Gold (their improbability drive spaceship) trying to figure out how to make a cup of tea. The computer, who by the way enjoys the challenge, has to search vast amounts of data to get the brew just right. Unfortunately, it is this time that the Vogons (space meanies, probably second cousins to Klingons) decide to attack the Heart of Gold. Zaphod Beeblebrox, the ex-president of the galaxy, can't get the computer to fend off the attack. He doesn't know it's busy making Arthur a cup of tea, and when Arthur figures out why Zaphod can't get the computer's attention he's not sure he should tell Zaphod exactly what it is the computer is busy with. You see, Arthur and Zaphod don't get along very well. If you like this chapter you'll like the whole trilogy.

Sometime last year, Dennis Kitz was commissioned to write a banner display program on the Color Computer for a museum. The program had to have a top and bottom title line, and a scrolling message in between. GOTO 46 where in this month's Custom Color Dennis shares the program with us.

Sweet Add-a-Line (GOTO 60) is a sweet program. Author Richard Ramella wrote this combination data base management/accounting program to help him wade through shoebox after shoebox of receipts and check stubs at taxtime. Although too late for this year's tax compilation, it's nice to know that life will be easier for next year's returns.

GOTO 64 for Math Drill, a program to help make your kids

Please turn to page 8

Telewriter-64™

the Color Computer Word Processor

- 3 display formats: 51/64/85 columns × 24 lines
- True lower case characters
- User-friendly full-screen editor
- Right justification
- Easy hyphenation
- Drives any printer
- Embedded format and control codes
- Runs in 16K, 32K, or 64K
- Menu-driven disk and cassette I/O
- No hardware modifications required

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

...one of the best programs for the Color Computer I have seen...

— Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminet, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot-graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

File and I/O Features: ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

*...truly a state of the art word processor...
outstanding in every respect.*

— The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs \$49.95 on cassette, \$59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.) To order, send check or money order to:


Cognitec
704 N. Nob Ave.
Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add \$2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.

Circle No. 4 on Reader Service Card



"THE ALTERNATIVE"

COLOR COMPUTER DISK SYSTEMS

<p>NOW ONLY 449⁹⁵</p> <p>NOW ONLY 549⁹⁵</p>	<p>40 TRACK DRIVE</p> <p>80 TRACK DRIVE</p>	<p>200 K BYTES</p> <p>400 K BYTES</p>
<p>USER STORAGE</p>		

ROM SOFTWARE

A Full Featured Basic Compatible DOS

INCLUDES: TD-99 Disk Controller w/ CCMO & DOS ROM • 40 or 80 Track Disk Drive • Power Supply • Case • 2 Drive Cable • 9 Disk Utility Programs • CCEDT9 Disk Text Editor • Disk Text Processor I

Manufactured Under License From Tall Grass Technologies

Editor / Assembler CO-RES9

CO-RES9 is a Co-resident Editor/Assembler that will allow you to create, edit and assemble machine language programs for the color computer. It will quickly and efficiently convert assembly language programs into machine code files. It will output machine object code to either cassette tape in a 'CLOADM' compatible format or directly to memory for direct execution.

NOW ONLY

CO-RES9 editor/assembler tape w/ manual \$39.95- \$29.95

R.S. DISK EDITOR & ASSEMBLER Disk w/ manual \$79.95- \$49.95

TEXT PRO II

"The Professional's Word Processor"

- | | |
|--|--|
| <p>TEXT PROCESSOR FEATURES</p> <ul style="list-style-type: none"> • Character Fill • Programmable Footer • Right Justify Line • Multiple Footnotes • Three Indent Modes • Three Programmable Headers • Ten Programmable Tab Stops • Margin Justification • Left & Right • Decimal Align, Center, Left & Right Justify on Tab Column • Display & Input from Keyboard • Change Formatting During Processing | <p>TEXT EDITOR FEATURES</p> <ul style="list-style-type: none"> • Single Keystroke Edit Command • Append Files from Tape or Disk • Fully Integrated Disk File Handler • Edit or Process Files Larger Than Memory • (No Conversion Required) Fully ASC II Compatible • Full Featured Line Oriented Screen Editor • Search and Replace Any Character Pattern • Copy, Move or Delete Lines or Blocks of Text • Edit Basic, Text or Assembler Files |
|--|--|

TEXT PRO II Features Over 70 Commands In All. Disk ... \$79.95

TERMINAL PACKAGE

- Full Text Buffering • Printer Baud Rates 110-4800
- Terminal Baud Rates 300 To 9600 Baud
- Automatic Word Wrap Eliminates Split Words
- Full/Half Duplex
- Full Disk Support For Disk Version
- Send Control Codes From Keyboard
- ASCII Compatible File Format
- Automatic File Capture



- Display On Screen Or Output Contents Of Buffer To Printer
- Save & Load Text Buffer To Tape Or Disk
- Send Files Directly From Buffer Or Disk
- Programmable Word Length, Parity & Stop Bits
- Automatic Buffer Size At Memory Limit

Datapack on tape w/ manual \$24.95

Diskpack for R.S. disk w/ manual \$49.95

All Orders Shipped From Stock

Add \$2.50 Postage

5566 Ricochet Avenue Las Vegas, Nevada 89110 **(702) 452-0632**

PRINTOUT FORMS



SOFTWARE-COMPATIBLE FORMS

FOR YOUR CoCo

**CHECKS • STATEMENTS • INVOICES
LABELS • QUICKMAILERS • MULTI PURPOSE FORMS**

Quantities as Low as 500 with Your Imprint!
1,2,3,4 Part NCR or Carbon

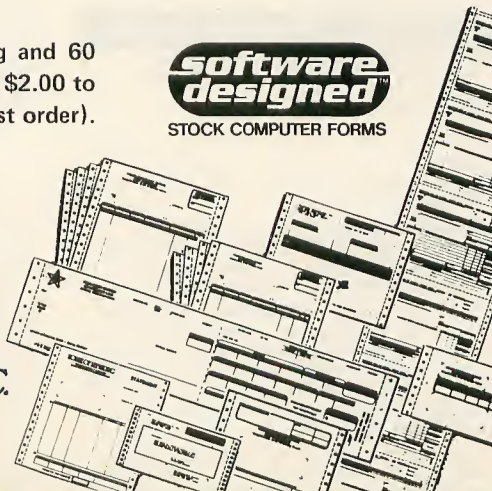
Samples, 32 Page Color Catalog and 60 Page Programming Manual. Send \$2.00 to cover postage (refundable with 1st order).



STOCK COMPUTER FORMS

**LOW, LOW PRICES
FAST SERVICE!**

BOB'S PRINTING, INC.
48750 VAN DYKE
UTICA, MICHIGAN 48087
(313) 739-6800



Circle No. 5 on Reader Service Card

The Color Computer... MAGAZINE

ISSN 0736-9492

Editor

Kerry Leichtman

Assistant to the Editor

Caron L. Taylor

Art Director

Illona M. Jennings

Art Assistant

Dawn Peterson

Technical Editor

Jamie Tietjen

Review Editor

Terry Kepner

Contributing Editors

William Barden Jr.

Jake Commander

Dennis Kitsz

Copy Editor

Debra Marshall

Technical Consultants

Paul Detwiler

Steve Odneal

Art Production

J.L. Patterson

Rod McCormick

Cathi Leavitt

Publisher

James S. Povec

Advertising Director

David J. Ezequille

(207) 236-9621

Highland Mill

Camden, ME 04843

Circulation Director

Lori A. Hellevig

Controller

John Delile

Pam Ward, Assistant

Office Manager

Faith H. Jones

©New England Publications Inc., 1983. All rights reserved. Contents of this magazine may not be reproduced in whole or in part unless expressly authorized in writing by the Publisher. TRS-80 and Color Computer are trademarks of the Radio Shack Division of Tandy Corporation. TDP System 100 is a trademark of Tandy Corporation.

This magazine is published by New England Publications who is solely responsible for its contents.

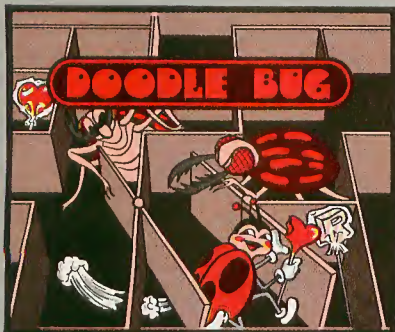
The Publisher assumes no responsibility for the return of unsolicited manuscripts, queries or artwork. Materials submitted to The Color Computer Magazine should be accompanied by a stamped, self-addressed envelope. Editorial offices located at Highland Mill, Camden, ME 04843.

U.S.A. Newsstand distribution by Curtis Circulation Company.

Phototypesetting by Camden Type 'n' Graphics — Camden, Maine; Lithography by Camden Printing — Camden, Maine; Printing by The Lane Press — Burlington, Vt. Extra effort by Connie Leavitt.

Computerware® Proudly Presents...

from our long list of Color Computer software for home, work, business and programmers ...



Your Lady Bug hussles thru an intricate maze of barriers & turnstiles, avoiding enemy bugs & skulls.
Cass \$24.95 Disk \$29.95



Turn your keyboard into a musical instrument with a digital synthesizer.
Cass \$21.95 Disk \$26.95



Centipedes & katepillars are tame compared to the challenge & aggression in this great game!
Cass \$21.95 Disk \$26.95



You must dive thru shark infested waters to get the treasure. Timing & strategy are crucial ...
Cass \$21.95 Disk \$26.95



New! Improved! The most realistic graphics arcade game ever!
Cass \$24.95 Disk \$29.95



Your Rail Runner must scurry over busy tracks dodging trains & handcars to rescue the hoboes!
Cass \$21.95 Disk \$26.95



Full feature modem software. Load & save from RAM Buffer, Macros, any duplex or parity, much more ...
Cass \$29.95 Disk \$39.95



Complete editor & word processor with 51 x 24 upper & lower case display.
Disk \$49.95



Modifies screen display to 51 x 24 for BASIC & your other software.
Cass \$24.95 Disk \$29.95

Add shipping of \$2 surface or \$5 air/Canada. Visa & MasterCard accepted. Dealer inquiries invited. Computerware® is a trademark of Computerware®.



P.O. Box 668, Encinitas, CA 92024 (619) 436-3512

Circle No. 6 on Reader Service Card

Continued from page 4

better math students. The program allows for keeping track of students' progress and is difficulty selectable.

In April we published Jake Commander's memory map. GOTO 68 for the logical follow-up to the map, Jake's disassembler. It's a no-frills disassembler specially designed to make working with machine-language programs easier.

REVIEW\$ kick off this month with Adventure International's Color Computer Sea Dragon. Also reviewed are a few other games, utilities, two new replacement keyboards, and Part II of the smart terminal review.

Aside from the INKEY\$ department and an increasing

number of pages, we have another new addition to **The Color Computer Magazine's** staff. Welcome aboard to Jamie Tietjen. Jamie has many responsibilities here, so many in fact that he hasn't had time yet to unpack and properly move into his new home. One of the first things Jamie did here was take over the load tape program. So beginning with this issue **The Color Computer Magazine** will be available on tape. Thank Jamie for no longer having to type until your fingers bleed. March and April's programs will be available, as an introductory offer, on the same tape. A second tape will feature the programs from the May issue, and the third will have this issue's programs.

That's all for now. Enjoy the issue.

— K.L. Editor

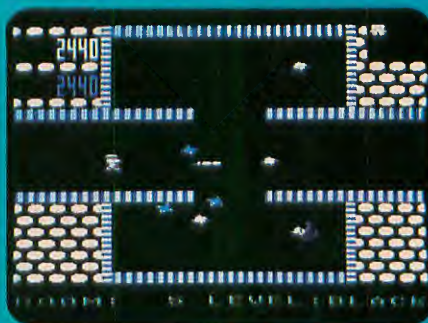


Who says all the good games are for somebody else's computer?

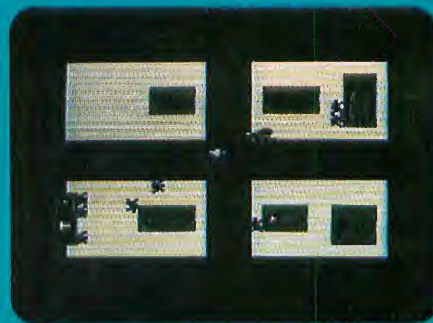
Synapse Software turns your color computer from a micro to a monster!



PROTECTOR II™



SHAMUS™



PICNIC PARANOIA™

Only \$34.95 in disk or cassette at independent software dealers everywhere.



Or buy direct from the Synapse Elite. Send check or Visa/Master-card number. Include \$34.95 for each game plus \$2 for shipping and handling.

synapse

5221 Central Avenue, Richmond, CA 94804 • (415) 527-7751

Circle No. 7 on Reader Service Card

All letters are subject to editing
for space considerations.



INKEY\$

The Color Computer Magazine
Highland Mill
Camden, ME 04843

First Our Response

You overwhelmed us. Sure we expected a lot of mail, and sure we expected (hoped) it would be complimentary, and sure we knew that our first INKEY\$ section would begin with kudos from our readers. But you overwhelmed us with your kind responses to our efforts. We thank you. — Eds.

Congratulations on the introduction of **Color Computer**. With your lineup of talent it should be a good magazine, and one which has been sorely needed for a long time.

Gregory F. Ludwig
Rice Lake, WI

I bought a copy of your magazine the first day it hit the newsstands. To my enjoyment it was a special magazine for my Color Computer and only my Color Computer. Boy did that swell my head. I enjoyed the feeling so much I mailed a subscription card that same night in Manhattan.

Thomas J. McCaffrey
New Windsor, NY

Thanks for the nicest Valentine I've ever received. Your premiere issue of **The Color Computer Magazine** just arrived. I ran through it and am amazed, delighted, and grateful. Keep up the good work. You started off with flying colors.

Phil Crump
Cloverdale, OR

I just bought your premiere issue and like it very much and have already subscribed. Keep up the great work! We Color Computer owners need it. Thank you.

David Madrick
Kew Gardens, NY

Upon reading your magazine I subscribed within the week! When it was brought to my attention that it was published by New England Publications in Camden, Maine, it surely made me feel proud to be a so-called "back woodsman."

The Reader Service card was an excellent feature in your magazine. I was surprised at the colorful and well thought out advertisements! You are to be commended on the choice of articles and programs. I am anxiously awaiting the April issue. Hope to see you for many years to come.

Susan J. Bouchard
Millinocket, ME

Nothing I have seen in years starts off with such an impressive list of writers. Dennis Kitz alone would make any magazine.

R.W. Odlin
Sedro-Woolley, WA

Congratulations on your premiere issue. I was suffering from Color Computer blues, tired of searching the latest magazine for articles about my new Color Computer. Your articles are outstanding. I'm happy to know I own an incredible machine. Thank you Jake Commander. I CSAVEd the graphics trip through the

Spiral Galaxy—fantastic trip—also Tick Talk by Richard Ramella.

Thank you for curing my Color Computer blues.
Irwin Meyers Jr.
Lakeville, MN 55044

Never in my life have I seen anything like **The Color Computer Magazine**, and to think it all happened in our state of Maine. Your first issue is so beautiful and great, words could never do it justice. Congratulations and a real pat on the back for all involved.

James A. Nyman
Millinocket, ME

Congratulations on your premiere issue. I have been waiting for a publication that offered tips, programs, and projects for the Color Computer without having to sift through useless articles about other machines. This is probably the first magazine I have read cover to cover. Enclosed is my subscription order. I don't plan on missing an issue.

Bill Antoniak
Columbus, OH

Received your magazine today. I took it to work this afternoon and have read it cover to cover twice. The articles are the best written of all the Color Computer magazines I have subscribed to. It seems you know what the majority of Color Computer owners need; simple straightforward articles that are not, and repeat, not over the head of the new owner.

I now understand more about disks from your short article than from 10 other articles I've read. Because of your magazine I know I will finally be able to start learning and using my Color Computer as it was meant to be.

Ted Tizek
Crestview, FL

I have produced many programs for the Color Computer, but haven't been able to decide which magazine to submit them to for possible

publication. Now I am positive that your magazine is the right choice after seeing the first class quality of your premiere issue.

Stephen Lai
Palatine, IL

Your premiere issue nudged out *PC Magazine* for the best first issue I've ever seen. I turned the subscription card right around.

L.W.C. Dye
Bloomingdale, IL

We were excited to find your premiere issue, but were then disappointed to find most programs required Extended Color Basic. We hope future issues will contain programs for the 16K Color Basic unit.

J.R. Hilton
Brashear, MO

Sounds like a challenge to you programmers. — Eds.

We have just purchased your first magazine, and are we thrilled! We are both new to the computer field, having just bought a 32K Color Computer. Thank God for your magazine. We found it interesting, funny, educational, and easy to understand. Thank you!

E. Rice
Niton Junction, Alberta

I had to write to tell you how excited I was when I picked up your first issue. It's a great magazine and just what I wanted! The software sources, the programs, the timely articles are all great! Best of luck to the success of **The Color Computer Magazine**.

Charles Atkins
Bethany, OK

Wow! You perceived a need and filled the gap. I'm looking forward to future issues of **The Color Computer Magazine**. It complements *Byte* much better than any other magazine by specializing on the best small computer made.

Robert M. Worth Jr.
Grand Rapids, MI
Please turn to page 12

SEE WHAT'S NEW THIS MONTH at QUASAR ANIMATIONS

SOFTWARE



The Official
ZAXXON
by SEGA

Probably the most incredible arcade game ever is now available for the Color Computer. **NOTE:** this is **the official ZAXXON**, not an imitation!

32K Tape or Disc **\$39.95**

THE KING

by Tom Mix Software

Four full graphic screens. Exciting sound and realistic graphics. Never before has the color computer seen a game like this.

Tape **\$26.95**

Disc **\$29.95**

SKY-DEFENSE

Can you survive the first wave of attack? Or the next? Or the next? Only your joystick will ever know! Features horizontal flight in highres graphics, and fast-paced action. Machine language; joystick required. 16K. **\$12.95**

BIGNUM

If you dislike seeing numbers like 1.23045 E 23, and wish you could have **all** the accurate digits instead, then BIGNUM is for you. Add, subtract, multiply, divide and raise BIG numbers to BIG powers and get totally accurate results. Even if you are satisfied with an approximation, without this program the Color Computer would return an "OV ERROR" with this problem: 34↑45 BIGNUM returns the entire 68 digit result! Accurate to 1,024 digits in 16K & about 3,068 digits with 32 RAM.

16K. **\$9.95**

HARDWARE

16K-32K UPGRADE KIT

Kit includes 8 200 ns #4116 Factory Prime Chips, piggybacked sockets, SAM socket, and "32K" button to replace the 16K on your computer's case. Easy to remove. No soldering to computer. **\$25.95**

64K UPGRADE KIT

200 ns #4164 chip set will upgrade your "E" board easily. Factory Prime Chips. Instructions included **\$49.95**

Nanos Reference Cards

Color Computer & TDP-100

Color BASIC & EXTENDED 4.95

DATA CASSETTES

CO5

C10

\$.65 Qty. 1-10 \$.70

\$.60 Qty. 11-20 \$.65

Soft Poly Cases Ea. \$.20



WABASH DISKETTES

Box of 10 **\$25.00**



JOYSTICK INTERFACE

Use ATARI or WICO Joysticks with your COCO! **\$17.95**



WICO COMMAND CONTROL JOYSTICK

The best joystick available for COCO ... **\$29.95**

Add \$1.50 per software order and \$2.00 per hardware order for postage and handling.

California residents add 6% Sales Tax.

QUASAR ANIMATIONS

1520 Pacific Beach Drive, San Diego, California 92109
(619) 274-2202

Your premiere issue is dynamite. Keep it up.

Bruce W. Goshorn
Alameda, CA

Okay guys, you really know how to make a user happy. **The Color Computer Magazine** is just the magazine I have been looking for. It's about time the Color Computer had a magazine all its own.

George Sprars Jr.
Richmond, CA

I'm afraid you've given me no choice. After reading your premiere issue, especially Dennis Kitz's Custom Color articles, I feel I must in my position as a Color Computer owner, order a subscription to your magazine. Thank you for one of the best new magazines to ever come out.

Peter E. Durham
Andover, MA

Building Directory

I wish you the best of luck with your new magazine. However I am writing to point out an error in the article Stash a Directory (March '83). The author states that only five sectors are used by the directory. This is not correct. The disk is capable of holding 68 files which would require almost nine sectors of the directory track. The five sectors mentioned in the article would allow only 40 files per disk. Most people will probably have fewer files than this since most of them require more than one granule. Yet your readers should be aware of this before attempting to use the program.

Dee D. Fitz
Waverly, OH

Versatile DMP-100

Your review of Disk Scripsit mentioned that the LP-VII did not have the underline feature. While this is true for the VII, Radio Shack's new version, the DMP-100, does have the underline feature and it can be set up for use with Disk Scripsit. Additionally, it will print at 1200 baud, is faster and quieter than the LP-VII and has a slightly modified lower case character set.

Norman Garrett
Glendale, AZ

Which ROM

One correction for your Custom Color article in the March issue. It states that you have to remove the Extended Basic chip and power up to see the revision number. There is a much easier way, simply EXEC 41175 and the revision number will appear on the screen.

Also, while I'm at it, 13095 is not the most memory you can get out of a 16K Extended Color machine. POKE 25,6:NEW will give you a full 14631 memory count, but you cannot use high-resolution graphic pages. Congratulations on a great magazine.

Eric White
Altamonte Springs, FL

Thanks Eric. That POKE is important for readers to know about. Some programs labeled to run on 16K assume you already know about the POKE. If you buy or key in a program that claims to run on 16K but doesn't, do the POKE and then try loading the program again.

— Eds.

Sorcerer's Mistake

I erred in my April Sorcerer's Puzzles. In the programs Color Stones and Firecracker I used a form of MID\$ command which works in Extended Color Basic but not in Color Basic. Labeling the programs Color Basic compatible was a mistake, though they will work in Extended Basic. At the end of this letter are the fix lines which will make the two programs work in Color Basic.

But first: I've had more than 200 programs published, and have erred five times. When I make a mistake, I realize it causes frustration for all who key in the program in good faith. Therefore, to all Color Basic users who tried the two programs, I make this offer: I will send a listing of an unpublished 4K Color Basic game called Race of the Century if you will send me a self-addressed stamped envelope. Further, if you will send me a blank cassette and 60 cents in stamps, I'll CLOAD the program and mail it back to you. Canadians should send 40 cents coin and self-

addressed envelope for the listing, and 75 cents coin and cassette for the CLOAD program.

This is for penance, not profit.

Color Stones fix lines:
300 D\$=LEFT\$(D\$,3)+G\$+
RIGHT\$(D\$,LEN(D\$)-4)
360 D\$=LEFT\$(D\$,A-1)+F\$+
RIGHT\$(D\$,27-A)
390 D\$=LEFT\$(D\$,A-1)+G\$+
RIGHT\$(D\$,LEN(D\$)-A)
490 N\$=MID\$(C\$,A-3,3)
492 IF N\$=A\$ THEN C\$=LEFT\$(
C\$,A-4)+B\$+RIGHT\$(
C\$,27-A+1) ELSE C\$=
LEFT\$(C\$,A-4)+A\$+RIGHT\$(
C\$,27-A+1)
493 N\$=MID\$(C\$,A+1,3)
500 IF N\$=A\$ THEN C\$=LEFT\$(
C\$,A)+B\$+RIGHT\$(
C\$,27-A-3) ELSE C\$=LEFT\$(
C\$,A)+A\$+RIGHT\$(
C\$,27-A-3)

Firecracker fix lines:
460 V\$=MID\$(A\$(B),C,1): IF
V\$=" " THEN 530 ELSE S=
VAL(V\$): A\$(B)=LEFT\$(
A\$(B),C-1)+" "+RIGHT\$(
A\$(B),LEN(A\$(B))-C)

Richard Ramella
1493 Mountain View Avenue
Chico, CA 95926

64K Upgrade

I like your new magazine, especially the article by Dennis Kitz. One question. Your review by Bob Rosen on the TDP 100 says that the TDP is identical to the newer Color Computers. If this is so what is the procedure to upgrade from 16 to 64K?

Lee Hills
Raleigh, NC

Remove capacitors C58, C60, C62, C64, C66, C68, C70, and C72. Then move two jumpers to the left of U21 and one jumper above U28 down to the 64K position. Solder the two bare staking pins to the left of U17 together. Install 64K chips.

— Eds.

DBM Errors?

After running Paul Detwiler's DBM program (March '83) I have run into two bad subscript errors, one at 6140 and the other at 9090. I checked each DIM statement, but to no avail.

Any suggestions on what might correct this?

M.M. Shockley
Wichita, KS

The problem is not a bug, rather an attempt to do more with the program than your system is capable of. Because of the lack of error trapping routines in the program, you have to, by trial and error, try different field and record number configurations.

— Eds.

Extended ROMs

Your Custom Color article is very good. I am having trouble obtaining the Extended Basic ROMs at nearby Computer Centers. The article states that I can obtain the ROM without the kit at Computer or Repairs Centers. This doesn't seem to be so.

Fred Staden
Akron, OH

A number of other readers had similar problems. Anticipating this Ed Juge sent in the following letter. — Eds.

We just noticed in your first issue, a statement in Dennis Kitz's article on page 43, which is not true.

Although we do make available through our National Parts Operation component parts for all of our products, a ROM has no replacement component parts.

It is true that the ROM by itself is available to our Repair Departments from National Parts, as a replacement part for a ROM which has gone bad. We are not able to sell the ROM by itself to an individual...it must be purchased as the upgrade kit. The reason is the royalty payable on all original sales of this software. ROMs sold through National Parts do not trigger a royalty payment and therefore can be used only to replace a defective part.

I'm sure Dennis had no way of knowing this, and I'm not sure where he got his figures, but I feel certain there will be a number of questions from customers who attempt to follow his advice and are not able to obtain the ROMs.

Ed Juge, Director
Computer Merchandising
Radio Shack

Setting The Standards

WHAT THEY ARE SAYING ABOUT COLORPEDE

"...forefront of the pack..." the **Rainbow**, Dec. '82 "...an outstanding offer." **N. Vernon, IN** "...the best graphics I have seen to date" **Erie, PA**
 "It is great!" **Dayton, OH** "...the best graphics and playability of any color computer game" **McKeesport, PA**

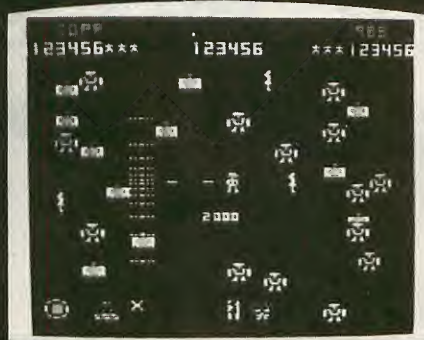


COLORPEDE

This truly outstanding engineer designed, 100% machine language game with multi-colored high resolution characters and fast action will challenge the most avid arcade buff. Can be played by 1 or 2 players controlled with joy sticks or key board. Joy stick control is fast, smooth and accurate. As COLORPEDE slithers through the toad stools, you attempt to destroy the COLORPEDE, knock out the menacing Bouncing Bug and eliminate toad stools while accumulating higher and higher scores. Demonstration mode with top 5 scores. Pause feature. For 16K Color Computer and TDP-100.

Cassette-\$29.95

INTRODUCING



ROBOTTACK

Ultra fast arcade action with colorful high resolution graphics. You are the super human who must fight off the attacking robots and save the remaining humans from destruction. You have super powers, can shoot in any direction and move anywhere on the screen to accomplish your vital mission.

Engineer designed, 100% machine language. Can be played by 1 or 2 players with joy stick control. Top 5 scores displayed. Pause feature. For 16K Color Computer and TDP-100 with joy sticks.

Cassette-\$24.95

TO ORDER:

VISA, MASTERCARD, Money Order. Please allow 2 weeks for checks. Add \$1.50 for shipping, \$3.00 outside U.S. 4% tax in Mich.


intracolor
COMMUNICATIONS

P.O. Box 1035, East Lansing, MI 48823
 (517) 351-8537

DEALER INQUIRIES INVITED.

FOR THE COLOR COMPUTER & TDP-100



SOFT CITY

Your largest single source of programs and products for the COLOR COMPUTER / TDP 100

MODEM MADNESS:

Save \$50 on a U.S. Robotics Micro Link 300 modem. Rugged aluminum housing. Direct connect, with LEDs and self-test.

List \$179 — SALE \$129

GAMER'S SPECIAL!! SAVE OVER 25%

DOODLE BUG (Computerware)

The greatest maze game ever; like the Lady Bug arcade game. Colorful hi-res graphics, and great sound.

COLORPEDE (Intracolor)

Slick centipede action, complete with poison mushrooms!

WIZARD'S TOMB (Skyline)

Multi-player adventure for the whole family!

Total value \$67.85, yours for \$49.95! Don't delay!

☐ We are dealers for:

- ☐ AMDEK
- ☐ B5
- ☐ CHROMATIC SOFTWARE
- ☐ COGNITEC
- ☐ CONSOLINK
- ☐ COMPUTERWARE
- ☐ CORNSOFT
- ☐ CUSTOM SOFTWARE ENGINEERING
- ☐ DATASOFT
- ☐ EIGEN SYSTEMS
- ☐ FRANK HOGG LABORATORY
- ☐ INTRACOLOR COMMUNICATIONS
- ☐ MARK DATA PRODUCTS
- ☐ MICRO TECHNICAL PRODUCTS
- ☐ NEC

LIFE IN THE FAST LANE! PROGRAMMER'S 3-PAK

BASIC AID (Eigen Systems)

Use it once, and you will never be without it! A real time saver. Takes the drudgery out of BASIC programming with its 2 key command entry and user-definable keys. Auto line numbering and moves.

STRIPPER (Eigen Systems)

Take the fat out of your programs. Spaces and REMarks are removed to let your new or existing programs run fast.

QUICKSORT (Skyline)

A machine language sort routine that can be easily used in your programs. BASIC sorts that take hours can be done in seconds with QUICKSORT.

Buy BASIC AID and STRIPPER for \$42.90, and get QUICKSORT (a \$12.95 value) FREE! Act Now!

- ☐ PEACOCK ENTERPRISES
- ☐ PRICKLY PEAR SOFTWARE
- ☐ THE PROGRAMMER'S GUILD
- ☐ SKYLINE SOFTWARE
- ☐ SOFTCORE SOFTWARE
- ☐ SPECTRAL ASSOCIATES
- ☐ SPEECH SYSTEMS
- ☐ STAR MICRONICS
- ☐ SUGAR SOFTWARE
- ☐ TDP ELECTRONICS
- ☐ TRANS TEK
- ☐ TOM MIX
- ☐ U.S. ROBOTICS
- ☐ VERBATIM
- ☐ YORK
- ☐ ETC., ETC....

SKYLINE 64K Memory Upgrade Kits

8 guaranteed 64K memory chips, solderless installation instructions, Skyline's 64K BOOT and PAGER programs (a \$20 value).

All for the super-low price of \$49.00!

Order yours today!

ORDERING INFORMATION

ALL ITEMS SHIPPED FROM STOCK

Phone orders
may be placed at:

(312) 260-0929
(Our voice line),

or through our
Color Computer
Bulletin Board
Service:

(312) 260-0640
(METROWEST BBS)

Mail orders
and requests for catalogs
should be sent to:

SOFT CITY
442 Sunnyside
Wheaton, IL
60187



SPECTRAL ASSOCIATES

16K Arcade Quality Games
For TRS-80 Color Computer

Only
\$21.95



Circle No. 11 on Reader Service Card

SPECTRAL ASSOCIATES, 141 HARVARD AVE., TACOMA, WA. 98466

BEST SELECTION ANYWHERE

TOLL FREE FOR ORDERS ONLY: 1-800-426-1830 8:30-4:30 P.S.T.

GREAT UTILITIES

Except WA, AK, HI

FLEX+ DOS

BUSINESS OFFICE: 206-565-8483

BEST EDITOR/ASSEMBLER

We accept VISA, MASTERCARD, AMERICAN EXPRESS.

SUPER MACHINE LANGUAGE GAMES

Add 3% for shipping. NO C.O.D. All prices U.S. FUNDS.

FANTASTIC BASIC GAMES

To find out about our other products, write or call for catalog.

BOOKS

We decided to to do this summer...

... write an original game for the Color Computer. It can be an adventure, simulation, arcade, or any type of game imaginable. It can be written in Basic or assembly language. It can be long or short, it's all up to you. Just make sure you get it to us by Labor Day, September 5, 1983.

Don't let this opportunity ooze away like so much cocoa butter on a hot summer day. Who knows, you may find yourself lying on a beach on a 90 degree day thinking to yourself, "Why am I roasting myself like so much flank steak, I could be writing an original game for **The Color Computer Magazine** Summer Programming Project?" Just then a beach ball hits your head, bounces up against a nearby beach umbrella, and lands in the upraised arms of a lifesaver waving someone closer to the shore.

You frantically search your travel bag for paper and pencil and scribble a few notes about the event that just inspired your first (or newest) Color Computer game, Beach Ball Wars. Will it be the next

Space Invaders, Pac-Man, Zaxxon, or Eliminator? Maybe not with the title Beach Ball Wars, but then again who knows? Stranger things have happened.

The contest is divided into two categories: Basic and assembly language. As you will notice from looking at the prize list,



give you something

both grand prize winners will come away with an almost identical load of loot. They differ only where the sponsor of the prize specified that they wish a particular winning category be awarded their contribution.

Send as many entries as you like to:

The Color Computer Magazine

Summer Programming Project

Highland Mill Mall

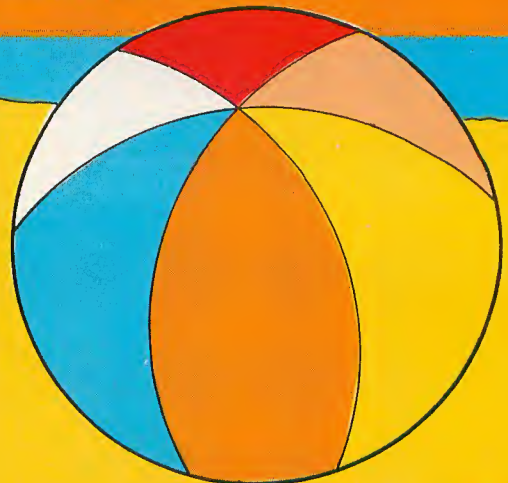
Camden, ME 04843

Entries should be submitted on cassette tape or disk with clearly written instructions for use. All entries will be held until October 1, 1983. For the return of entries not selected for prizes, include a self-addressed stamped envelope with your program. All winners will be announced in December's issue of **The Color Computer Magazine**. Entries will be judged by **The Color Computer Magazine's** editorial staff. All decisions are final.

GRAND PRIZES

Aardvark Software	(2) \$100 gift certificates
Adventure International	(2) \$125 gift certificates
Avalon Hill	Shoot Out at the OK Galaxy# Breakthru +
Chattanooga Choo Choo	(2) \$25 gift certificates
Cer Comp	\$100 gift certificate#
Chromasette Magazine	(2) six-month subscriptions
Cognitec	(2) Telewriter 64 word processors
The Color Computer Magazine	(2) paid publication, one- year subscription
Computerware	(2) \$100 gift certificates
The Data Man	(2) \$25 gift certificates (2) Visualizer program writing aids (2) Blank keyboard overlays

DSL Computer Products	Cassette player/recorder#
Eigen Systems	Colorcom/E terminal program# Basic Aid +
Harmonycs	(2) \$25 gift certificates
Homebase Computer Systems	(2) \$75 packages of all Homebase products
Inter + Action	(2) \$25 gift certificates
International CC Club	(2) 2-year memberships
Intracolor Communications	Colorpede#
Jarb Inc.	Gemini X printer#
Micro School Programs	Color Text +
The Micro Works	\$50 gift certificate#
Micro Technical Products	Rommel game# Banner program +
Nelson Software Systems	(2) Adventure Trilogy games
Prickley Pear Software	(2) \$50 gift certificates (2) T-shirts
The Program Store	(2) \$25 gift certificates
Radio Shack	(2) Drive 0 disk drives with controller
Real Software	(2) \$100 gift certificates
Soft City	(2) US Robotics Micro Link 300 direct connect modems with cable
Spectral Associates	\$25 gift certificate#
Spectrum Projects	(2) \$25 gift certificates
Sugar Software	(2) \$25 gift certificates
T & D Software	(2) half-year subscription to software service
TCE Programs	(2) Packages of three programs
Tom Mix Software	(2) \$50 gift certificates
Zeta Software	Wormtube game#
# Machine language winner only + Basic winner only	
1st Runners-up	
Paid publication and a one-year subscription to The Color Computer Magazine. Prickley Pear T-Shirt	
2nd Runners-up	
Paid publication in The Color Computer Magazine. Prickley Pear T-Shirt	



624 KBYTE SYSTEM!



**New
3" disk
cartridge**

COLOR AMDISK-III COMPATIBLE.

The AMDISK-III micro-floppy disk system is an engineering breakthrough in disk size, storage capacity, media protection and user convenience. It's fully compatible with your Radio Shack*® Color Computer. Enjoy a full 624 KByte† (formatted) storage capability and the extra convenience of the new 3" hard plastic encased diskettes. They fit into a shirt pocket and are easy to mail, too.

The AMDISK-III drive system is ruggedly constructed for years of trouble-free operation, and is backed with our 90 day warranty on parts and labor.

Just circle the reader service number to receive complete specifications.

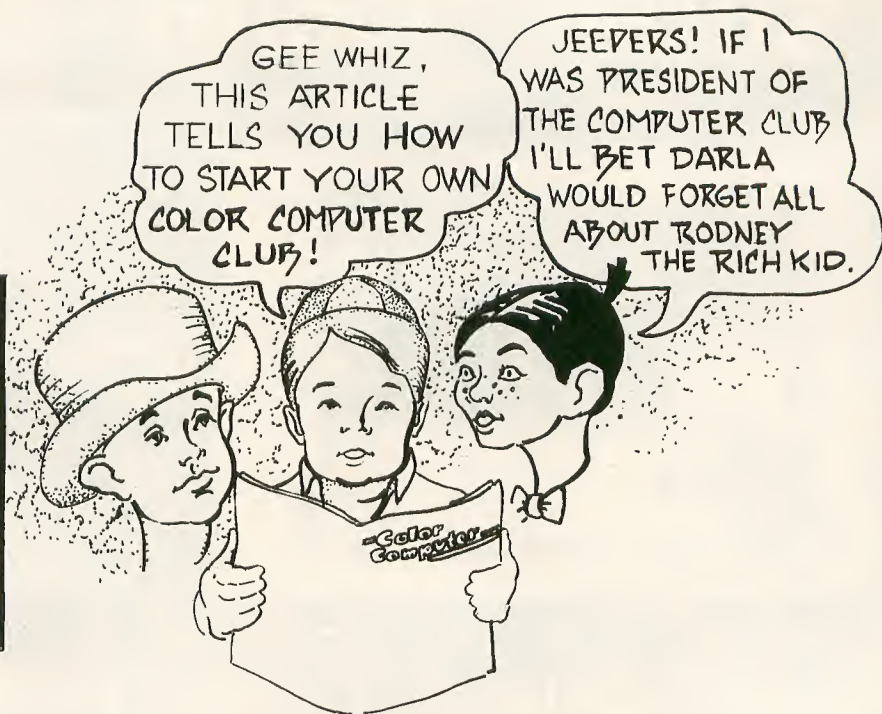
*Radio Shack is a registered trademark of Tandy Corporation.
†Requires recording on both sides.

DEALER INQUIRIES INVITED

2201 Lively Blvd. • Elk Grove Village, IL 60007
(312) 364-1180 TLX: 25-4786

AMDEK CORP.

Amdek . . . your guide to innovative computing!



Computer Club Primer

Let experience from the Silicon Valley tell you how.

SO YOU WANT TO START a Color Computer club? Through all the hard work, frustrations, disappointments and set-backs, always remember that you started the club to have fun. I would be remiss if I were to paint an exceptionally rosy picture, and would feel better throwing the negatives at you before writing about the fun.

Forming a Color Computer club will have many trying moments. But being a member, or an officer, of a functioning club will (most likely), outweigh the troubles you'll go through forming the blasted thing.

My club, The Silicon Valley Color Computer Club, is fairly large. Our 100+-member roster began with only four members. This is not to say that all clubs will or should grow to this size, but that's our club's history. I will use our club as an example repeatedly in this article; not because you should model your club after ours, but because we are a growing club and happy with how our club runs. Use this advice as a starting point for your group. Reject what you don't like, or what will not apply to your surroundings. With that disclaimer, let's get organized.

by Shawn Jipp

Why?

The answer to *why* should be as simple as the question. To share information and have fun. Make a list of what you'd like to get out of a Color Computer club. Later, as you meet other computerists, add their ideas to the list. Don't worry about sticking to them, goals should serve to guide your initial steps rather than become hard-and-fast rules.

How to Find Members

As with most things Color Computer, the best place to start is at your local Radio Shack. Tell the manager or computer expert that you want to start a club and ask them to put you in touch with other owners. Ask if you can post a small notice on a bulletin board (the cork or electronic kind), if they have one.

Place a small classified ad in your local newspaper. Write to magazines and ask

to have a membership request listed in their Letters To The Editor column.

Where?

Where you meet will depend on the number of members in your club. If you start with only a few, you can use your own home. But be prepared, growth may quickly outpace your living room. (Ever tried squeezing 100 people into your house, let alone your living room?)

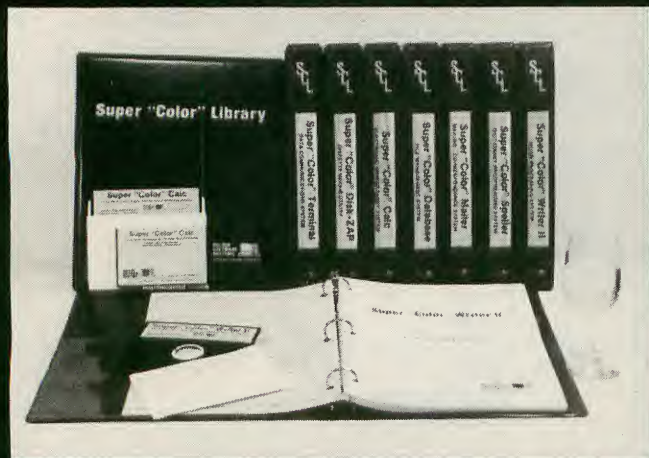
As your club grows, you'll have to find suitable quarters. Try computer stores, computer/electronic manufacturers, banks, and schools as possible meeting sites. Places like these don't usually charge for organizations like yours to use their facilities.

Our club meets at a disk manufacturer's building in a room set aside for users groups. It can accommodate up to 300 people with outlets for computers at almost every seat. Electrical outlets at your meeting place is important so you can participate in demonstrations and other activities.

Please turn to page 22

Super "Color" Library™

For the TRS-80 Color and TDP System 100 Personal Computers



No matter what kind of problem you are trying to solve with the Color Computer, there is a program in the ever-expanding integrated, **Super "Color" Library** that will give you the solution; Faster, Better, Smarter!

Every Library program features **MEMORY-SENSE** to determine your computer's memory, from 16 to 64K, and adjusts automatically to maximize work space. All programs, except the **Super "Color" Speller** and **Super "Color" Disk-ZAP**, feature a true lowercase display with below line descenders. Each program has been written specifically for the Color Computer in fast machine code to be totally compatible for optimum performance — Something a motley assortment of programs from diverse sources or a passel of overpriced, wallet-FLEXing software from a bygone era simply can not achieve.

The **Super "Color" Library** has all the power, speed, dependability and compatibility you will ever need so build your library a volume at a time or put the full power of the complete library of problem solvers to work right away.

64K
Compatible

— NEW! —

Super "Color" Writer II™

VERSION 3.0 By Tim Nelson
THE INTELLIGENT WORD PROCESSOR

32x16 &
51-64-85x21&24
WITH REAL
LOWERCASE
DISPLAY

The **Super "Color" Writer II** is for those who desire the best. It is the most powerful, fastest, most dependable and versatile word processor available for the Color Computer, from 16 to 64K. The **Super "Color" Writer II** has features for the most demanding professional, yet it is easy enough for newcomers to master.

Of course the **Super "Color" Writer II** has all the features you would expect from the highest quality word processor, such as a clear, crisp and readable professional display with your choice of display colors, 9 display formats; standard 32x16 & 51-64-85x21 & 24 with real lowercase descenders; full 4-way cursor control, sophisticated edit commands, the ability to edit any BASIC program or ASCII textfile, seven delete functions, locate and change, wild card locate, a real block move & copy, word wrap-around, programmable tabs, display memory used and left, non-breakable space, multiple headers and footers, dynamic text formatting, comprehensive format parameters, use with ANY printer at any baud rate from 110 to 9600 baud, automatic justification, automatic pagination, automatic centering, automatic flush right, underlining, superscripts, subscripts, pause print, single-sheet pause, optionally print comments, append text files, available in a ROMPAK cartridge for maximum work space, but that's only half of the story. No other program can even begin to compare in features with the **Super "Color" Writer II**.

Check These Exclusive Features

MEMORY-SENSE adjusts to computer's memory (16-64K) for maximum work space; **TYPE-AHEAD**, **TYPAMATIC KEY REPEAT** and **KEY BEEP** for the pros; 3 **PROGRAMMABLE FUNCTIONS**; **AUTO PHRASE INSERT**; **COLUMN CREATION**; **TEXT FILE LINKING**; **HELP MENU**; **A TRUE EDITING WINDOW IN ALL 9 DISPLAY MODES**; **TRUE FORMAT WINDOW** to display line lengths up to 255 characters, with horizontal and vertical scrolling to replicate the printed page including centered lines, headers, footers, page breaks, page numbers, margins, giving a perfect printed document every time. Also makes hyphenation a snap; **TRUE AUTOMATIC JUSTIFICATION** for neat, even left and right hand margins; Ability to use **CHARACTER CODES** for printing special characters available with your printer; freedom to embed as many **PRINTER CONTROL CODES** as desired anywhere in the text, **EVEN WITHIN JUSTIFIED TEXT**; 90-plus page tutorial manual.

ADDITIONAL DISK FEATURES: Read a directory, Display free granules, Save with Automatic Verification, Load and Append ASCII files and BASIC programs, Kill files, and Link files from disk for continuous printing, 54K bytes of workspace available with a 64 K system. Only the best offers all of these features.

TAPE \$69.95

ROMPAK \$89.95

DISK \$99.95

Tutorial only \$15.00 (Refundable with purchase)
Tape & Disk require 32K for lowercase display
Previous **Super "Color" Writer II** owners call for upgrade policy

Super "Color" Mailer™

By Tim Nelson

The **Super "Color" Mailer** is a powerful multi-purpose mailing list merging and sorting program including lowercase display that uses files created by the **Super "Color" Writer II**. Combine files, sort and print mailing lists, print "Boilerplate" documents, automatically insert text in standardized forms, address envelopes, the list is *endless*.

TAPE \$39.95

DISK \$59.95

Operators Manual only \$10.00 (Refundable with purchase)

NEW

Super "Color" Speller™

By Peter A. Stark

The **Super "Color" Speller** is a fast machine-code proofreading program to correct **Super "Color" Writer** files. Automatically proofreads your documents against a 20,000 word stock dictionary, plus your own customized dictionary and corrects typos or marks them for special attention.

AVAILABLE ON DISK ONLY \$69.95

Operators Manual only \$10.00 (Refundable with purchase)

32x16 & 51-64-85x21&24 Display With Lowercase Descenders And **16** Thru **64K** Too!

NEW Super "Color" Calc™

ELECTRONIC SPREADSHEET By Kevin Herrboldt

Now you can answer those "What if?" financial projection, forecasting, budgeting, engineering and calculating questions with precision, speed and power using the **Super "Color" Calc**, truly the finest electronic worksheet and financial modeling program available for the Color Computer, from 16 to 64K. Now every Color Computer owner has access to a calculating and planning tool rivaling VisiCalc!™ containing all its features and commands and then some. You need only change one variable and you instantly see how that change affects your assumptions. You can even use VisiCalc templates freely with **Super "Color" Calc**! Combine spread sheet tables with **Super "Color" Writer II** documents to create ledgers, projections, statistical and financial reports and budgets.

Features include: 9 display formats; standard 32x16 & 51-64-85x21&24 with real lowercase descenders * MEMORY-SENSE to adjust to computer's memory (16-64K) for maximum work space; Full-size 63x256 worksheet * Easy to use * HELP Menus to make learning faster * Machine code speed and high precision * Total flexibility in calculating * Up to FOUR VIDEO DISPLAY WINDOWS to compare and contrast results of changes * Sine and Cosine functions, Averaging, Exponents, Algebraic functions, and base 10 or 16 entry * Multi-layered Column and Row Ascending and Descending sorts * Locate formulas or titles in fields * Easy entry, replication and block moving of frames * Global or Local column width control up to 81 characters each * Create titles of up to 255 characters * Typamatic Key Repeat * Key beep * Type-ahead * Print up to 132 column worksheet * Prints at any baud rate from 110 to 9600 * Print formats savable along with worksheet * Enter control codes for customized printing.

DISK FEATURES: Read a directory; Display free granules; Kill files, Save with Automatic Verification; Load files; Append disk files for complete worksheet printing. 54K bytes of worksheet space available with a 64K system.

Tutorial and sample templates are supplied with the program.

ROMPAK \$89.95 **DISK \$99.95**

Tutorial only \$15.00 (Refundable with purchase)
Disk requires 32K for lowercase display.

Super "Color" Disk-ZAP™

By Tim Nelson

Now the dreamed-of repair of I/O errors is a reality. The **Super "Color" Disk-ZAP™** is the ultimate repair utility for simple and quick repair of all repairable disk errors. Designed with the non-programmer in mind, the **Super "Color" Disk-ZAP™** will let you retrieve all types of bashed files, including BASIC and Machine Code programs.

This high-speed machine code disk utility has a special dual cursor screen display to show HEXIDECIMAL and ASCII displays simultaneously. You are able to: Verify or modify disk sectors at will * Type right onto the disk to change unwanted program names or prompts * Send sector contents to the printer or any other RS-232 device * Search the entire disk for any grouping of characters * Copy sectors * Backup tracks or entire disks * Repair directory tracks and smashed disks * Full prompting to help you every step of the way * 50-plus page Operators Manual which helps you simply and quickly fix the vast majority of disk errors, and teaches the rudiments of disk structure and repair.

AVAILABLE ON DISK ONLY \$49.95

Operators Manual only \$10.00 (Refundable with purchase)

**NELSON
SOFTWARE
SYSTEMS**



9072 Lyndale Avenue So. 612/881-2777

A Division of Softllaw Corporation Minneapolis, Minnesota 55420 U.S.A.

TRS-80 is a trademark of Tandy Corp Visicalc is a trademark of VisiCorp.

**WE TAKE THE COLOR COMPUTER SERIOUSLY.
AUTHORS' SUBMISSIONS ARE ENCOURAGED.**

Super "Color" Terminal™

THE FINEST TERMINAL PROGRAM ANYWHERE!

Version 3.0 By Dan Nelson

The best has become even better, with many new features including 9 display formats; 32x16 & 51-64-85x21&24 with real lowercase descenders, plus compatibility with the 64K Color Computer. This user-friendly program makes communicating with ANY computer a breeze even for a newcomer. Communicate using your modem with all the popular information services such as Dow Jones, Compuserve, The Source, and local BBS's, clubs, friends, or the main-frame at work. You can also communicate directly with other microcomputers, such as the TRS-80 I/III, II, other Color Computers, Apples, IBM PCs, etc., via RS-232 without using a modem. Save the information or PRINT IT!

FEATURES: MEMORY-SENSE to adjust to computer's memory (16-64K) for maximum work space; Selectively print data at baud rates from 110 to 9600 * 54K of data storage with 64K disk system. 128 character ASCII keyboard * Automatic graphics mode * Word mode (word wrap) for unbroken words * Send & receive **Super "Color" Writer II, Database & Calc** files, ASCII files, Machine Language & BASIC programs * Set communications baud rate from 110 to 9600, Duplex: Half/Full/Echo, Word length: 5 6 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Unique CLONE feature for copying any tape * Lower case masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Files compatible with other Library programs.

ADDITIONAL DISK FEATURES: Works with up to four Disk Drives; Call a directory, Print free space, Kill disk files. Save with Automatic Verification and Load textfiles or BASIC programs; Save and Load KSM'S to the disk.

TAPE \$49.95 **ROMPAK \$59.95** **DISK \$69.95**

Operators Manual only \$10.00 (Refundable with purchase)

Previous **Super "Color" Terminal** owners call for upgrade policy.

NEW Super "Color" Database™

This high speed machine language program including true lowercase displays fills all your information management needs, be they for your business or home. Inventory, accounts, mailing, lists, family histories, you name it, the **Super "Color" Database** will keep track of all your data.

The **Super "Color" Database** features MEMORY-SENSE to adjust to computer's memory (16-64K) for maximum work space. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design, each divided into as many fields as you need. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending order. The math package performs arithmetic operations and updates other fields which is especially useful when used as an order entry and invoicing system. You can create reports, or lists for mailings, or whatever. Create files compatible with the **Super "Color" Writer II** and **Terminal**. Up to five different print formats are available, and control codes may be imbedded for customized printing.

AVAILABLE ON DISK ONLY \$79.95

Operators Manual only \$10.00 (Refundable with purchase)

For Orders ONLY Call Toll Free

1-800-328-2737

VISA

Customer service and product support call (612) 881-2777.

MAIL ORDERS: \$3 U.S. Shipping (\$4 CANADA, \$10 OVERSEAS)

Personal checks allow 3 weeks. **ORDERS SHIPPED SAME DAY!**

Available at Dealers everywhere.

If your Dealer is out of stock ORDER DIRECT!

Publicity

As I eluded to before, advertising and publicity are very important to a new and growing club. I know of some clubs with members who want to keep their clubs small, like secretive underground organizations, keeping expansion to an absolute minimum. Beware of such attitudes attaining leadership positions in your club. They won't benefit the club, and may resist increasing membership in the club for fear that new members might eventually seek their office. Sounds like politics, right? If you plan your club correctly from the start, you'll avoid many of these problems.

I'm not saying that the bigger the club the better, but I am endorsing the idea that more people mean more information... and more fun.

Appoint, nominate, or vote on a person to handle publicity. Some of the responsibilities this person would handle are responding to membership inquiries, sending press releases to magazines and bulletin boards, posting fliers, and other related projects. Make sure that person has a durable tongue able to last through long hours of stamp licking; in other words, a real Color Computer zealot. It would also help if he had a modem.

Mailing Addresses

At first, use a member's home address (yours?), as the club's central location. When the club can afford it get a post office box. Get two keys so that two people can alternate retrieving mail if the post office is not on anyone's normal daily route. Make sure that magazines and your local Radio Shack know your address, and keep them informed as to any changes when they occur. You won't get much information if no one knows where you are.

Dues

We voted to charge a \$5 one-time membership fee for new members and \$12 annual dues for all members. This seems to be in line with what other clubs charge.

How you use the money is something for each club to decide. We have a hard library (books), and a soft library (software), and have used some of the funds to purchase items for these collections. Dues also cover our paper, postage, and newsletter costs. Future plans call for a swap meet and a pizza party with expenses paid by our dues account.

Once you've collected the money,

you'll need to open a bank account for its safe keeping. On the account paperwork you should authorize three signatures requiring that no monies can be withdrawn without two of these three signatures.

All expense records should be maintained accurately. At the close of every year the treasurer should present a business report to the club. The account's current balance should be announced at every meeting. Be careful with dues money, it's easy to overspend other people's money.

Organization

Our club started with a volunteer president and secretary. That was fine for the first few months, but is not a workable long-term method of organization. We now have elected officers: president, vice president, secretary, and steering committee. We also have non-elective posts: newsletter editor, librarian, and publicity person.

The steering committee's main purpose is that of checks and balances for the president. It assures that the club's direction is not determined by one person. It also helps the person serving a term as president by easing some of the demands on his time.

Library

We are now in the process of buying every book available about the Color Computer. We allow members to check out books on the provision they are returned at the next meeting. The club librarian is responsible for cataloging each selection and charging for late returns. The fine is 25 cents per day, but the fine cannot exceed the replacement cost of the book.

A special library bookmark is placed in each book to indicate the book's return due date. We rubber stamp the paper edges of the book with the words, "*The property of the Silicon Valley Color Computer Club.*"

Software piracy is one of the most controversial problems of the computer industry. There is no easy solution. At first our library had some cassettes that were unquestionably pirate versions. When our club leadership changed and we became more organized, some members wanted to use club funds to purchase more software for the library. It was time to decide how to deal with the piracy issue.

I consulted several other clubs; none of them collected copyrighted software. One club had been threatened with a

lawsuit for having a certain vendor's ROMpaks (not Radio Shack's) in their library. That club's president discussed the problems with an attorney who told him the software company would lose if the case ever went to court. The lawyer likened the situation to public libraries and their collection of copyrighted materials. He recommended that the club take out the ROMpaks in question to avoid a costly lawsuit. He further suggested that they obtain written permission from a program's author before including a program in their library. As of this writing, only Radio Shack has agreed to allow ROMpaks in their library.

Our steering committee unanimously adopted this policy. We seek author's permission before placing any software in our library with the understanding that the library copy will only be used so that members can examine and try the software to assist them in their purchasing decisions. Our club's official policy is against piracy. The software in our library, aside from any we get permission for, is all in the public domain.

Rules and Regulations

We tried to cover as many situations in our constitution as possible. Everything from impeachment procedures to the time limit permitted for the business portions of each meeting.

Our constitution is four pages long and serves as the basis for our bylaws. The constitution basically states who and why we are. The bylaws, on the other hand, are nine pages long and go into more detail in things such as cost of membership, yearly business meeting times, duties of the newsletter editor, and so on.

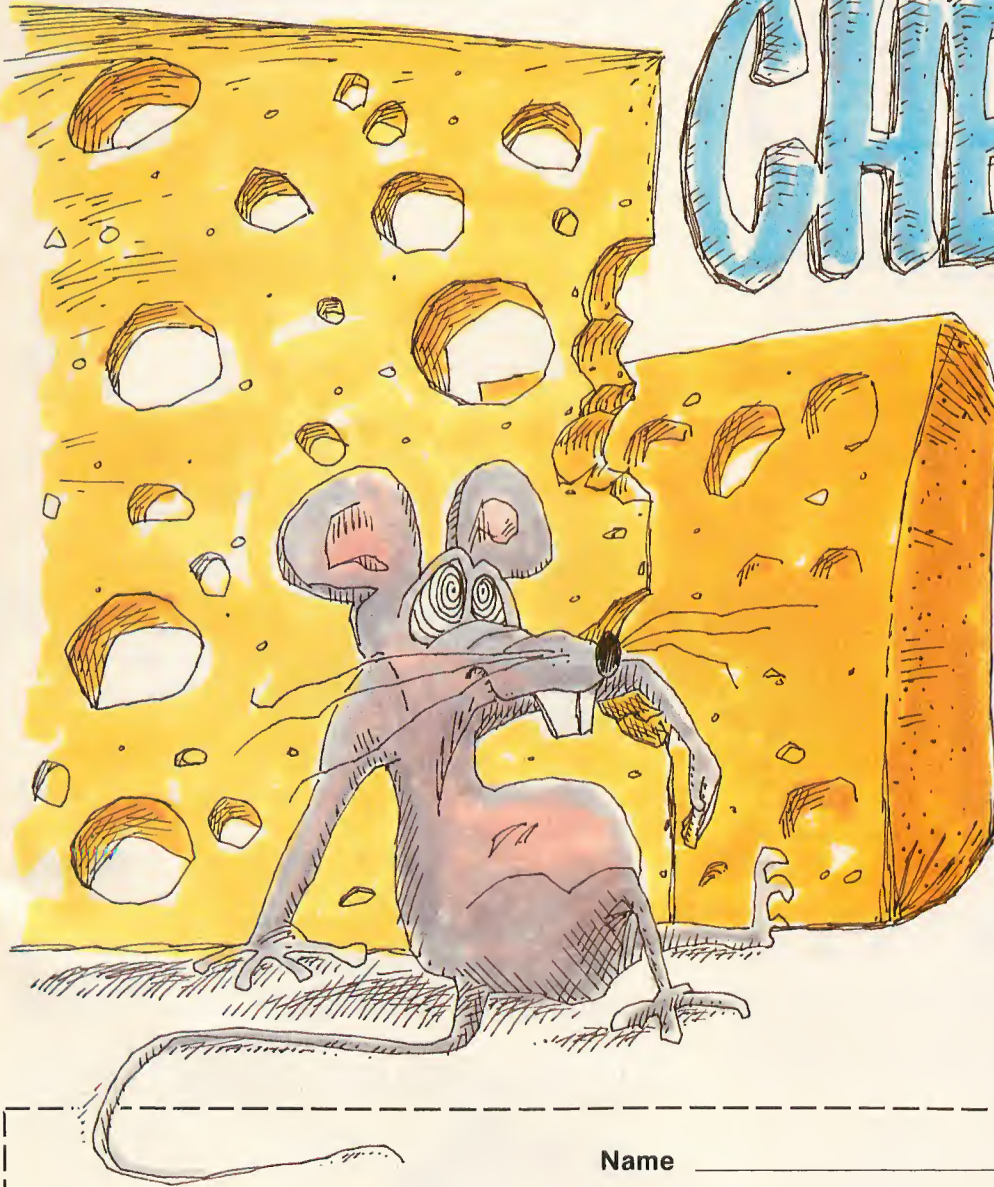
We made it harder to amend the constitution than to change the bylaws. Luckily for us, the person who wrote most of the documents had a background in forming small corporations.

Smaller, less formal groups may not feel such a need for such sophisticated rules and regulations, but should consider implementing them anyway as a form of protection and guidance for the club.

Summary

I hope this has given you a good idea of what you need to consider before you start your own Color Computer users group. It is by no means as simple as it may seem, and will definitely require more time than you anticipate. But... it can be rewarding. ■ ■ ■

Were the whole CHEESE



Follett Library Book Company offers more services to schools and libraries than any other jobber in the country. Not only can we totally fulfill your school library book needs, but we are your one-step computer software ordering source for the Radio Shack, the Commodore and Apple computers. And now, new from Follett, we offer a complete line of instructional micro-computer books, both hard-bound and paperback, with complete catalog kits. Fill out the coupon below for our brochure on micro-computer books and/or software catalog.

Name _____

School/Library _____ Dist. # _____

Address _____

City _____ State _____ Zip _____

☐ Yes, send me your micro-computer book brochure.

☐ Yes, send me your software catalog.

My computer is (check below)

☐ a Radio Shack

☐ a Commodore

☐ an Apple



FOLLETT LIBRARY BOOK CO.

4506 Northwest Highway, Crystal Lake, IL 60014

TOLL-FREE 800-435-6170

In Illinois, Hawaii, Alaska
call collect: 815-455-1100

THE TOP-RATED COCO WORD PROCESSOR:

Colorware researched the word processors available for the Color Computer. We came to the very same conclusion that so many review articles have! Telewriter-64 is, by far, the superior word processor for the Color Computer.

Why is Telewriter so much better than the others? For one thing, it has overcome the 32x16 character display limitation of the Color Computer. No small feat, Telewriter accomplishes this by generating its own set of characters in software. You select 51x24, 64x24 or 85x24 character displays by merely issuing a format command. If you have ever used a word processing system, you know how important it is to be able to see a good portion of your text on the screen.



Telewriter-64 also generates true lower case characters. This is much preferable to the reverse characters that merely "represent" lower case letters in other co-co word processors.

Telewriter-64 is feature packed. Besides the standard features

found in any word processor, Telewriter also includes: user-friendly full-screen editing, rapid cursor and scrolling control, page jump, right justification, menu-driven disk or cassette access, compatibility with spelling checkers (such as Spell-and-Fix), and a clever double check that asks the user "Are you sure?" before executing any operation that would kill any sizeable amount of your text.

Telewriter-64 runs on any 16K, 32K, or 64K system (extended Basic not required) and works with

printer. There is even a "typewriter" mode which sends typed lines directly to your printer.

With advanced word processing software such as this, your color computer becomes a truly powerful word processing system, with a price that makes sense for the personal user.

Beyond impressive capability, Telewriter-64 simply makes any kind of writing a pleasure. It is a truly sophisticated system that is marvelously easy to learn and enjoyable to use.

TELEWRITER-64

any printer. It has all of the control codes necessary to take full advantage of all of the features in any

Disk \$59.95

Cassette . \$49.95

SUPER-PRO KEYBOARD
REPLACEMENT PROFESSIONAL
KEYBOARD KIT...ONLY \$69.95

- Contour molded, full travel keys for fast smooth typing.
- Custom made to fit precisely. Has same key layout.
- Complete, easy instructions for any CoCo or TDP-100.
- Ideal for word processing and other serious CoCo use.

Note: For computers manufactured after Oct. 1982, add \$4.95

UPGRADE IN JUST MINUTES!

COLORWARE LIGHT PEN



ONLY \$19.95
FREE PROGRAM
CASSETTE INCLUDED

- Plugs directly into your joystick port.
- Comes with six fun & useful programs on tape.
- Easy instructions show how to use it with Basic.
- Comptible with light pen software such as Computer Island's "Fun-pak."

EXTENSION CABLE FOR YOUR MODEM/PRINTER

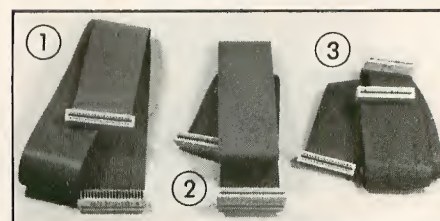
Place your modem or printer where you want. 15 ft. cable with four-pin male and four-pin female DIN connectors.

\$19.95



Circle No. 15 on Reader Service Card

Colorware Incorporated
78-03A Jamaica Avenue
Woodhaven, NY 11421
(212) 647-2864



QUALITY DISK DRIVE CABLES

High quality cable and high force, gold plated contacts ensure the utmost in connection reliability for your CoCo or TDP-100.

- ① **Disk pack extender, 3 ft. . . \$29.95**
Allows you to move your disk drive interface back and out of the way.
- ② **One Drive Disk cable \$19.95**
- ③ **Two Drive Disk cable \$29.95**

COCO ROM/PROJECT/PRODUCT CASE



QUANTITY	PRICE EACH
2-4 (2 min.)	\$5.50
5-9	3.50
10-99	2.75
100 & up	CALL

Give a Professional look to your project or product

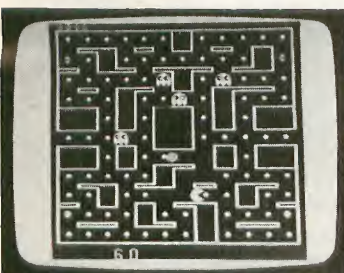
- Designed especially for the Color Computer ROM slot.
- High quality 3 piece injection molded black plastic with spring-loaded door.
- Same size and specifications as Radio Shack ROMpak



TOLL FREE ORDERING
800-221-0916

Orders only, NY & Info call (212) 647-2864

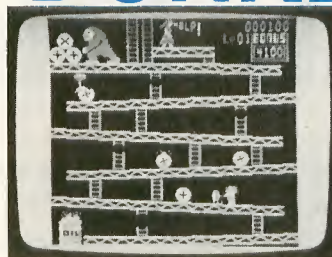
WE PAY ★ The shipping on any order that includes at least one game.
★ For the phone call. Use our convenient toll free watts line.



GHOST GOBBLER

From Spectral Associates, this "Pac" theme game is the best of it's type. Brilliant color, action and sound, just like an arcade gobble your way to glory, but watch for those ghosts! Get in on the wild fun of this game craze now. Requires 16K. Tape: \$21.95, Disk: \$25.95

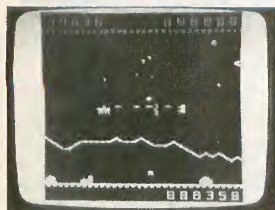
DONKEY KING



DONKEY KING

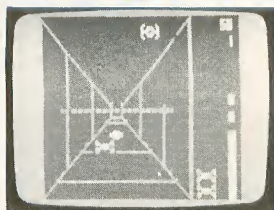
You simply can not buy a more impressive game for your color computer than this new wonder from Tom Mix. The graphics, sound, and animation are all just astonishing! There are four different graphic screens and each is endless fun. Requires 32K. Tape: \$24.95, Disk: \$27.95

GHOST GOBBLER



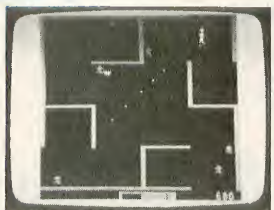
PROTECTORS

There are several good versions of the "Defender" theme available for the CoCo. None, however, rival this one from Tom Mix. No other game matches the detailed graphics and sheer excitement of this top seller. Requires 32K. Tape: \$24.95, Disk: \$27.95



INTERGALACTIC FORCE

Your space fighter roars into the Death Corridor. Lock-on and blast the enemy fighter from the sky. Now try dropping one into Death Star's narrow exhaust vent. It takes skill and guts. Good luck! With "Star Wars" theme song. From Anteco. Requires 16K. Tape: \$24.95



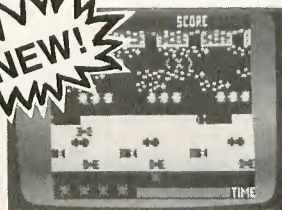
ANDROID ATTACK

Spectral Associates' very well done "Berserk" type game with some interesting added features. Each cassette contains both the 16K and 32K version. The 32K version has voice output! Plenty of action. Tape: \$21.95



CREATURE FEATURE

From Color Software, comes a lightening swift shoot & dodge the enemy game. It's clever cross between "Robotron" and "Berserk" themes, with bullets flying everywhere. Solid, shoot-em-up-fun. Requires 16K. Tape: \$17.95, Disk: \$19.95



FROGGER

Just released by The Cornsoft Group, this is the officially licensed version from Sega, the arcade manufacturer. It has it all! 4 lane super highway, snakes, turtles, logs, alligators, etc. Lots of action and laughs! Requires 16K. Tape: \$19.95

THE COLORCADE

SUPER JOYSTICK MODULE

ONLY

\$19.95



★ It's a Joystick Interface

Now you can connect any Atari compatible joystick to your CoCo. These sticks are extremely rugged and provide very fast response and real arcade type action. They will improve the play of almost any game. The difference will amaze you!

★ It's a Rapid Fire Module

Press the fire button on your joystick and get a great burst of fire instead of just a single shot! Adds tremendously to the many shooting type games that do not have repeat fire. With variable burst speed.

★ It's a 6 ft. Extender Cord

THE ATARI

ONLY

\$8.50



A well proven joystick, the Atari is known for being rugged and reliable. It gives good response and is the standard among home video players. Now at a great price! Use with module above.

ZIRCON VIDEO COMMAND

ONLY

\$14.95

A GREAT BUY!



This one has received outstanding reviews. Its unique design fits the hand beautifully and it has the truly fast and positive response needed for high speed play. Actually out-performs some joysticks that cost \$50 or more.

WICO FAMOUS "RED BALL"

THE BEST YOU CAN BUY

\$34.95



The high performance joystick from the people who make them for the arcade machines. Built to take the abuse of even the most enthusiastic player. This is the best! Wico #15-9730. Use with module above.

—TOLL FREE—

800-221-0916

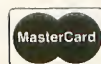
—ORDER LINE—

ORDERING INFORMATION

ADD \$2.00 PER ORDER FOR SHIPPING.
WE ACCEPT VISA, MASTERCARD, CHECKS, M.O.
C.O.D. ADD \$3.00 EXTRA.
NY RESIDENTS ADD SALES TAX.
OVERSEAS, FPO, APO, ADD 10%.
DEALER DISCOUNTS AVAILABLE.
IF ONE OR MORE GAMES ARE INCLUDED, SHIPPING IS FREE.



Colorware Incorporated
78-03A Jamaica Avenue
Woodhaven, NY 11421
(212) 647-2864





16K Disk Basic

Math Drill

*Math made easier using your
Color Computer.*

by James Sanford

WHEN I REALIZED my kids were picking up math faster than I expected, I decided to write a program to drill them. This is easier said than done. To be useful, the system must be challenging and motivating. Such a program should be easy for the kids and instructor (daddy) to use and should also keep track of their progress.

MATHDRIL was written with these goals in mind. It's a simple program designed to exercise children in basic arithmetic skills. The program is easy to use and keeps track of their progress. It gives the instructor the ability to tailor each student's program, modify that program, and periodically check on each student's progress. I wrote the program for a 32K disk system, but it will easily run on 16K and can be modified for a cassette system.

Using MATHDRIL

When initially setting up the system, load the program, and add

5049 N\$ = "<STUDENT'S NAME>"

Then type RUN 5049. This lets you set the parameters and establish a file for each student. Then delete line 5049. This may seem cumbersome, but it only has to be done once when you add a new student to the system.

The program is simple to use, especially for the student. You load the program and type RUN. The program asks for the student's name, obtains his parameters from the disk, and starts drilling the student. You can stop the program after each problem. When you do, the disk file is updated with the student's most recent performance. Incidentally, a

two year old can be taught to recognize the few words he'll have to read, so advanced reading skills are not a prerequisite.

When the instructor wants to view a student's progress, he loads the program, and types RUN 5000. The program then asks you for the student's name, displays his grades and parameters and asks if you want to make any changes. When all updates are completed, the program stops.

Since nothing is child-proof, I put this program and the data files on a separate disk. I then put backup copies on a regular Basic disk, so that in the event of a system crash, you'll only lose the duplicate program and most recent data.

Modifications

MATHDRIL can be easily customized, and several variations come to mind. Although a disk system is most convenient, the program will run on cassette systems. Program Listing 2 is for cassette systems.

My five year old picked up on the concept of negative numbers quickly, but it might be to your advantage to set up a negative flag similar to the integer flag. This would let the instructor determine when a student will see negative numbers. The program contains a reward routine and this section can and should be customized for each student. This is easy to do because it is set aside in specific blocks of the program.

Line By Line

The first three lines of the program find out who the student is and initialize the program based on that student's pa-

rameters as decided by the instructor.

Line 10 generates random functions of random variables, goes to the appropriate subroutine, and lets the student make an orderly exit from the program.

Lines 100–140 form the routine for acknowledging correct responses. I used a display of random sounds and colors — something that my kids really like.

Lines 200–240 are the routine that handles incorrect responses. This is something distinctive that makes it obvious their answer is wrong.

Line 500 begins a termination routine that stores the updated data and signs off.

Line 1000 is the beginning of the addition routine. This takes the random numbers, displays them, and looks for a correct answer. Note that the input is interpreted as a string and converted to a number. This avoids having to explain what REDO? means when the two year old accidentally hits something other than a number. After comparing the response with the correct answer, the program calls the appropriate routine to tell the student if he's right or wrong. Three attempts are allowed on each problem. After that, the program moves to a new problem.

Line 1220 does the same for multiplication, line 1100 for subtraction, and lines 1300 and 1400 for division. Note that the division routine lets the instructor decide whether problems with rational but non-integer quotients are allowed. Asking a five year old and a two year old to solve problems to nine decimal places is a bit much. As they improve, the instructor can allow decimal quotients.

Line 5000 begins the instructor's portion of the program. When run, it asks for a student name, reads his performance data, and displays the grades for each type of problem. The instructor can then change the maximum number a student will have to deal with and the integer division flag. The program re-initializes all grades when parameters are changed, writes the new data to disk, and then asks for another student.

Results

The ultimate results of a program like this are how much a student learns, and equally important, how interested he remains. My son loves MATHDRIL and is pleased and excited every time he gets a right answer. Since I wrote the program and started checking his grades, he has consistently improved. Based on these two criteria, I consider the project a success.

Listing begins page 28



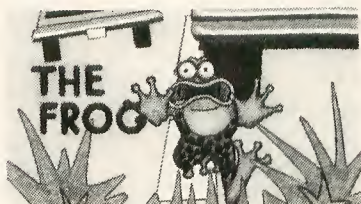
TOM MIX SOFTWARE

• FOR THE COLOR COMPUTER & TDP 100 • 3424 College N.E., Grand Rapids, MI 49505 (616) 364-4791 •

NEW

"THE FROG"

(C) 1983



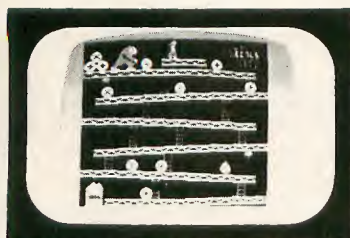
16K MACHINE LANGUAGE

\$27.95 TAPE

\$30.95 DISK

ARCADE ACTION

This one will give you hours of exciting play. ... Cross the busy highway to the safety of the median and rest awhile before you set out across the swollen river teaming with hidden hazards. Outstanding sound and graphics.



THE KING

1982

32K Machine Language

\$26.95 tape

\$29.95 disk

ARCADE ACTION - How high can you climb? Four full graphic screens. Exciting Sound - Realistic graphics. Never before has the color computer seen a game like this. Early reviews say: Just like the arcade - Simply outstanding!

NEW

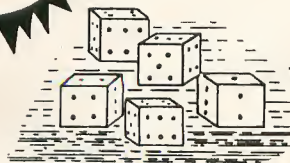
"YAAZEE"

(C) 1983

\$19.95

16K MACHINE LANGUAGE

EXT. BASIC



Yaazee is a 2 player game using five dice to get the best poker hand. After game is loaded flashing digit below player number determines which player rolls dice at the start of the game.

PROTECTOR

Exciting fast paced arcade game that looks and plays like the popular arcade game "DEFENDER". Wave after wave of enemy fighters drop bombs on your city. Destroy them before they destroy your city. Soon the mother ships appear firing laser blasts at you. Watch for the heat seeking mines.



\$24.95 TAPE \$27.95 DISK 32K MACHINE CODE

COLOR GOLF

Now sit at your computer and play nine or eighteen holes. Outstanding graphics in the fairway or on the green. Helps your game.

32K EXTENDED BASIC

\$17.95



NEW

SPACE SHUTTLE

1983

32K Ext. Basic

\$28.95
TAPE
ONLY



This program gives you the real feeling of flight. Full instrumentation complete to the max. Actual simulation of space flight. 32K Ext. Basic

NEW

"TRAPFALL"

By KEN KALISH

(C) 1983

ARCADE ACTION

The "Pitfalls" in this game are many. Hidden treasures, jump over the pits, swing on the vine, watch out for alligators, beware of the scorpion. Another game for the Color Computer with the same high resolution graphics as "The King."



16K MACHINE LANGUAGE

TAPE \$27.95

DISK \$30.95

KATERPILLAR ATTACK

Outstanding graphics and sound will end all of those trips to the arcade. So much like the arcade you have to see it to believe it. Requires Ext. Basic.

16K MACHINE LANGUAGE

\$21.95

DISK

\$24.95



OTHER GREAT GAMES

ALL PROGRAMS REQUIRE 16K

MOON LANDER•Fantastic Graphics. Land on the Moon if you can. 2 Programs. Ext. Basic **\$17.95**

DANCING DEVIL•Watch him dance to music or program him yourself. Machine Language. **\$14.95**

WAR KINGS•Battle to save your castle and king. High resolution graphics with outstanding sound make this one a real winner. 16K Machine Language **\$17.95**

ADVENTURES

TREK-16-Travel thru space with Spock and Capt. Kirk. Adventure! Tough! Ext. Basic. **\$17.95**

SHIPWRECK-Escape from a desert isle if you can. Great Adventure! Ext. Basic. **\$14.95**

ESCAPE FROM SPECTRE (Graphic Adventure)-You are a secret agent for British Intelligence sent on a mission to obtain the secret nerve gas formula being developed by S.P.E.C.T.R.E. to destroy the world. 16K Ext. Basic **\$17.95**

Call our BBS Number 616-364-8217 24 Hours a Day



ADD \$1.00 POSTAGE & HANDLING • TOP ROYALTIES PAID
MICHIGAN RESIDENTS ADD 4% SALES TAX • LOOKING FOR NEW SOFTWARE

BETTER SOFTWARE COMPANY
P.O. Box 16842 — Sta. B
Greenville, South Carolina 29606
(803) 233-2700

PRESENTS

**COLOR-STICK**

The **ORIGINAL** interface for
the TRS-80*
Color Computer to let
you use the famous:

ATARI* JOYSTICK*

Just plug your Atari or Atari like joystick (the Color-Stick enables the use of most joysticks made for the Atari) into the Color-Stick interface and then plug the Color-Stick into an empty joystick port.

The Color-Stick can improve scores 50% and more while making some games more exciting and fun to play.

Don't settle for cheap imitations. Only the **ORIGINAL** Color-Stick's small inline design allows you to just plug your joystick into it and forget it. The Color-Stick becomes a part of your joystick so it does not interfere with your game playing. In addition Color-Stick returns a full value of '63' for the right and down directions, even when using two joysticks and even in the diagonal directions, the others don't.

NOW Color-Stick has a new low price.....

Color-Stick interface \$12.95 each
two for \$22.95 (less joysticks)

Atari joysticks \$9.95 each

BETTER SOFTWARE COMPANY
P.O. Box 16842 — Sta. B
Greenville, South Carolina 29606
(803) 233-2700

Don't miss out order the **ORIGINAL**. Send your check or money order or better yet call today and order your Color-Stick.



Add \$2.00 per order shipping and handling. Bank cards welcomed (please include expiration date). Orders paid by cashiers check, money orders, bank cards and C.O.D. are shipped within 48 hours. Personal checks please allow 1-2 weeks. C.O.D. orders add \$1.50 extra. S.C. residents add 4% sales tax. *TRS-80 is a registered trademark of Tandy Corp. Atari is a registered trademark of Atari, Inc.

Table 1. Variable List

MAXNUM	The maximum number used	2	Subtraction
A,B	Random variables	3	Multiplication
Z\$,Z	Answer	4	Division
EF	Error Flag	J=	Grade
FI	Integer flag	0	Grade in percent for that function
I,J	Counters	1	Number of attempts
G(I,J)	Grade Array:	2	Number of correct responses
I=	Function		
1	Addition		

Program Listing 1.

```

1 CLS:INPUT"WHAT IS YOUR NAME";N$
2 'INITIALIZATION
3 OPEN "I",#1,N$:INPUT#1,MAXNUM,G(1,1),G(1,2),G(2,1),G(2,2),G(3,1),G(3,2),G(4,1),G(4,2),FI:CLOSE#1
4 F=RND(4)'FUNCTION SELECT
5 A=RND(MAXNUM):B=RND(MAXNUM):EF=0:ON F GOSUB1000,1101,1200,1300
6 INPUT"WOULD YOU LIKE TO STOP";Y$:IFY$="YES"THEN500ELSEGOTO10
7 'CORRECT ROUTINE
8 FORI=1TO20:CLS(RND(8)):SOUNDRND(255),1:NEXT
9 CLS0:PRINT@256,"CORRECT!!";N$:FORI=1TO500:NEXT
10 RETURN
11 'INCORRECT ROUTING
12 SOUND 30,10
13 PRINT"TRY AGAIN"
14 EF=EF+1
15 RETURN
16 'TERMINATION ROUTINE
17 OPEN"O",#1,N$:PRINT#1,MAXNUM,G(1,1),G(1,2),G(2,1),G(2,2),G(3,1),G(3,2),G(4,1),G(4,2),FI:CLOSE#1
18 CLS0:PRINT@240,"GOODBYE ";N$:END
19 'ADDITION ROUTINE
20 CLS:PRINT@240,A;"+";B;"=";
21 INPUTZ$:Z=VAL(Z$):G(1,1)=G(1,1)+1
22 IFA+B=Z THEN GOSUB 100:G(1,2)=G(1,2)+1:RETURN ELSEGOSUB200
23 IFEF=3 THEN 1100 ELSE GOTO 1010
24 CLS:PRINT"WE'LL TRY THIS AGAIN SOMETIME":RETURN
25 'SUBTRACTION ROUTINE
26 CLS:PRINT@240,A;"-";B;"=";
27 INPUTZ$:Z=VAL(Z$):G(2,1)=G(2,1)+1
28 IFA-B=Z THEN GOSUB100:G(2,2)=G(2,2)+1:RETURN ELSE GOSUB200
29 IFEF=3 THEN 1100 ELSE GOTO1110
30 'MULTIPLICATION ROUTINE
31 CLS:PRINT@240,A;"X";B;"=";
32 INPUTZ$:Z=VAL(Z$):G(3,1)=G(3,1)+1
33 IFA*B=Z THEN GOSUB100:G(3,2)=G(3,2)+1:RETURN ELSE GOSUB 200
34 IF EFG=3 THEN 1100 ELSE GO TO 1210
35 'DIVISION ROUTINE
36 IFFI=0THEN1330
37 IFA/B<>INT(A/B) THEN 1400
38 CLS:PRINT@240,A;" / ";B;"=";
39 INPUTZ$:Z=VAL(Z$):G(4,1)=G(4,1)+1
40 IFA/B=Z THEN GOSUB 100:G(4,2)=G(4,2)+1:RETURN ELSE GOSUB 200
41 IF EFG = 3 THEN 1100 ELSE GO TO 1330
42 A=RND(MAXNUM):B=RND(MAXNUM):GOTO1320
43 'TEACHER'S ROUTINE
44 CLEAR:CLS:INPUT"STUDENT NAME";N$:OPEN"I",#1,N$:INPUT#1,MAXNUM,G(1,1),G(1,2),G(2,1),G(2,2),G(3,1),G(3,2),G(4,1),G(4,2),FI:CLOSE#1
45 FORJ=1TO4:IFG(J,1)=0THENG(J,0)=0
46 IFG(J,1)<>0THENG(J,0)=100*G(J,2)/G(J,1)
47 NEXTJ
48 CLS:PRINTN$:PRINT"ADDITION":PRINTTAB(5);"ATTEMPTS",G(1,1):PRINTTAB(5);"GRADE",G(1,0);"%":PRINT"SUBTRACTION":PRINTTAB(5);"ATTEMPTS",G(2,1):PRINTTAB(5);"GRADE",G(2,0);"%":PRINT"MULTIPLICATION":PRINTTAB(5);"ATTEMPTS",G(3,1):PRINTTAB(5);"GRADE",G(3,0);"%":PRINT"DIVISION":PRINTTAB(5);"ATTEMPTS",G(4,1):PRINTTAB(5);"GRADE",G(4,0);"%":
49 PRINT"MAXNUM = ";MAXNUM:PRINT"INTEGERS ";IFFI=1THENPRINT"ON LY"

```

Listing continued


```

5040 INPUT"CHANGE PARAMETERS";ZZ$:IFZZ$="YES"THEN5050
5045 INPUT"ANOTHER STUDENT";ZZ$:IFZZ$="YES"THEN5010ELSE END
5050 CLS:INPUT"MAXNUM";MAXNUM:INPUT"INTEGERS ONLY <1> - YES <0>
- NO";FI
5060 OPEN"O",#1,N$:PRINT#1,MAXNUM,0,0,0,0,0,0,0,FI:CLOSE#1:GOTO
5045

```

Program Listing 2.

```

1 CLS:INPUT"WHAT IS YOUR NAME";N$
2 'INITIALIZATION
3 CLS:PRINT@256,"PRESS <ENTER> WHEN TAPE IS READY TO PLAY";:INPUT
QQ$:OPEN "I",#-1,N$:INPUT#-1,MAXNUM,G(1,1),G(1,2),G(2,1),G(2,2),G
(3,1),G(3,2),G(4,1),G(4,2),FI:CLOSE#-1
10 F=RND(4)'FUNCTION SELECT
11 A=RND(MAXNUM):B=RND(MAXNUM):EF=0:ON F GOSUB1000,1101,1200,1300
:INPUT"WOULD YOU LIKE TO STOP";Y$:IFY$="YES"THEN500ELSEGOTO10
100 'CORRECT ROUTINE
110 FORI=1TO20:CLS(RND(8)):SOUNDRND(255),1:NEXT
130 CLS0:PRINT@256,"CORRECT!!";N$:FORI=1TO500:NEXT
150 RETURN
200 'INCORRECT ROUTING
210 SOUND 30,10
220 PRINT"TRY AGAIN"
230 EF=EF+1
240 RETURN
500 'TERMINATION ROUTINE
505 CLS:PRINT@256,"PRESS ENTER WHEN TAPE IS READY TO RECORD";:IN
PUTQQ$
510 OPEN"O",#-1,N$:PRINT#-1,MAXNUM,G(1,1),G(1,2),G(2,1),G(2,2),G(
3,1),G(3,2),G(4,1),G(4,2),FI:CLOSE#-1
520 CLS0:PRINT@240,"GOODBYE ";N$:END
1000 'ADDITION ROUTINE
1010 CLS:PRINT@240,A;"+";B;"=";
1020 INPUTZ$:Z=VAL(Z$):G(1,1)=G(1,1)+1
1030 IFA+B=Z THEN GOSUB 100:G(1,2)=G(1,2)+1:RETURN ELSEGOSUB200
1040 IFEF=3 THEN 1100 ELSE GOTO 1010
1100 CLS:PRINT"WE'LL TRY THIS AGAIN SOMETIME":RETURN
1101 'SUBTRACTION ROUTINE
1110 CLS:PRINT@240,A;"-";B;"=";
1120 INPUTZ$:Z=VAL(Z$):G(2,1)=G(2,1)+1
1130 IFA-B=Z THEN GOSUB100:G(2,2)=G(2,2)+1:RETURN ELSE GOSUB200
1140 IFEF=3 THEN 1100 ELSE GOTO1110
1200 'MULTIPLICATION ROUTINE
1210 CLS:PRINT@240,A;"X";B;"=";
1220 INPUTZ$:Z=VAL(Z$):G(3,1)=G(3,1)+1
1230 IFA*B=Z THEN GOSUB100:G(3,2)=G(3,2)+1:RETURN ELSE GOSUB 200
1240 IF EF=3 THEN 1100 ELSE GO TO 1210
1300 'DIVISION ROUTINE
1310 IFFI=0THEN1330
1320 IFA/B<>INT(A/B) THEN 1400
1330 CLS:PRINT@240,A;"/";B;"=";
1340 INPUTZ$:Z=VAL(Z$):G(4,1)=G(4,1)+1
1350 IFA/B=Z THEN GOSUB 100:G(4,2)=G(4,2)+1:RETURN ELSE GOSUB 200

1360 IF EFG = 3 THEN 1100 ELSE GO TO 1330
1400 A=RND(MAXNUM):B=RND(MAXNUM):GOTO1320
5000 'TEACHER'S ROUTINE
5010 CLEAR:CLS:INPUT"STUDENT NAME";N$:CLS:PRINT"PRESS ENTER WHEN
TAPE IS READY TO PLAY";:INPUTQQ$:OPEN"I",#-1,N$:INPUT#-1,MAXNUM
,G(1,1),G(1,2),G(2,1),G(2,2),G(3,1),G(3,2),G(4,1),G(4,2),FI:CLOSE
#-1
5015 FORJ=1TO4:IFG(J,1)=0THENG(J,0)=0
5016 IFG(J,1)<>0THENG(J,0)=100*G(J,2)/G(J,1)
5017 NEXTJ
5020 CLS:PRINTN$:PRINT"ADDITION":PRINTTAB(5);"ATTEMPTS",G(1,1):PR
INTTAB(5);"GRADE",G(1,0);"%":PRINT"SUBTRACTION":PRINTTAB(5);"ATTE
MPTS",G(2,1):PRINTTAB(5);"GRADE",G(2,0);"%":PRINT"MULTIPLICATION"
:PRINTTAB(5);"ATTEMPTS",G(3,1)
5021 PRINTTAB(5);"GRADE",G(3,0);"%":PRINT"DIVISION":PRINTTAB(5);"
ATTEMPTS",G(4,1):PRINTTAB(5);"GRADE",G(4,0);"%
5030 PRINT"MAXNUM = ";MAXNUM:PRINT"INTEGERS ";:IFFI=1THENPRINT"ON
LY"
5040 INPUT"CHANGE PARAMETERS";ZZ$:IFZZ$="YES"THEN5050
5045 INPUT"ANOTHER STUDENT";ZZ$:IFZZ$="YES"THEN5010ELSE END
5050 CLS:INPUT"MAXNUM";MAXNUM:INPUT"INTEGERS ONLY <1> - YES <0>
- NO";FI
5060 CLS:PRINT"PRESS ENTER WHEN TAPE IS READY TO RECORD";:INPUTQ
Q$:OPEN"O",#-1,N$:PRINT#-1,MAXNUM,0,0,0,0,0,0,0,FI:CLOSE#-1:GOT
O5045

```

Circle No. 18 on Reader Service Card

COLOR COMPUTER SOFTWARE

Adventure games
THE ALCHEMIST'S LABORATORY
\$14.95

mix the ingredients that will
turn lead into gold
LOKAR'S MAGIC STAFF \$14.95
can you unlock the deadly secrets
of LOKAR'S magic staff?
MEGA MAZE - \$14.95

a wild, five dimensional space
maze adventure
SQUEEZE - \$14.95

arcade style game where aliens close
in from both sides at once.

COLOR SHOW DISPLAYS - \$8.95

five graphics programs that create
endless changing patterns
all programs 16-K extended basic
cassette only.

Send for free catalog.

We accept checks, money orders,
Visa and Mastercharge. (no C.O.D.'s)

Please add \$1.00 for shipping.

Send to:

REAL SOFTWARE CO.

P.O. BOX 401 HOPEDALE, MA 01747

(617) 393-6281

CLS orders EMAIL to 71505,430

Mass. residents add 5% sales tax

Dealer inquiries welcomed

MASTER DISK

○ Trouble finding your disk programs? Master
○ Disk to the rescue! Once you try it you'll wonder
○ how you ever got along without it. No typing re-
○ quired! Master Disk creates files directly from
○ your disk directories and searches them in 5
○ modes. Read any directory without switching
○ disk. Search all your disks for a desired
○ filename. Find disks with free space. Includes
○ accessory programs to print an alphabetic list
○ of all of your files (32K for sort required) or re-
○ build a crashed directory. New upgraded ver-
○ sion still runs in 16K systems. \$49.95

STAR PILOT

○ Take a trek into outer space to defeat the
○ enemy from beyond the galaxy. This is not just
○ another push the button and shoot game. To
○ find and destroy the enemy you will need a
○ steady hand at the helm, close attention to
○ your control panel, and a little luck. Call your
○ crew for repairs, try a ruse, or go in firing to save
○ our galaxy. "Ship's Computer" tells you ship's
○ status of a map of the known galaxy. Requires
○ 16K extended basic and includes 16K novice
○ version and 32K version with more challenge.
○ \$19.95

CATALOG

○ Our latest catalog on tape (No 3) revised for
○ latest prices and programs is \$3. Flip side has
○ 2 novelty programs and a tape utility similar to
○ those seen advertised for twice this price.
○ (Such a deal!)

Circle City Software

P.O. Box 30166

Indianapolis, Indiana

46220

COMPUSERVE EMAIL NO. [71645,514]

Circle No. 19 on Reader Service Card

Color Computer/29

How To Shop For Equipment

Stop! The smart shopper has more fun.

by Keith Baker

WHATEVER YOUR GOALS with the Color Computer, there are peripheral accessories to help you achieve them. Printers by the dozen, plotters, disk drives, and all manner of other peripherals are all just waiting to be bought. How do you decide which is best for you? What items work with what others? Where is the best place to purchase? Can you trust mail order houses?

The first step is to determine what you want to do with your computer. If your desire is hobby only, then bargain shopping may be the way to go. If your desire is for professional applications, set your sights on the best and save your money.

You need to learn as much as possible about the accessories you'll need before you buy. Talking to other users is a good place to start. Find out what accessory devices they use and what benefits they claim for each. Even more important, find out what types of equipment they want to buy and why.

Subscriptions to magazines dedicated to your computer will also prove invaluable, especially during the first year or so. Finally, if your town or neighborhood has a computer club, join it.

One note of caution, don't ask other computerists for copies of their programs. Unless the program is in the public domain, obtaining these copies is illegal. Respect the programmer's right to make a fair wage from his efforts. If you buy non-Radio Shack products, don't expect Radio Shack to service your equipment.

When you have learned as much as possible about the accessories you need, visit the computer dealers in your area. Evaluate their stock and ask to see the accessory you are interested in. Have the dealer demonstrate the equipment for you preferably connected to a Color Computer. If the dealer can't or won't do this for you, find another dealer. Demonstrations will help you evaluate the accessory, determine compatibility, and get to know the dealers who support your computer.

Check your dealer's prices and compare them to the mail order houses who advertise in magazines like **The Color Computer Magazine**. If you find what appears to be a good price, call the mail order house. Make sure the accessory has all the options you want, and that it's the same model as the one you saw on the dealer's shelf. Ask the salesperson if the accessory is compatible with the Color Computer. You'll probably already know the answer, but it's reassuring to know the salesperson does too. Be sure to get the salesperson's name. Find out if there are additional charges for freight and handling. Also, find out what provisions are made for warranty repair or replacement of defective units. If the salesperson cannot or will not answer these

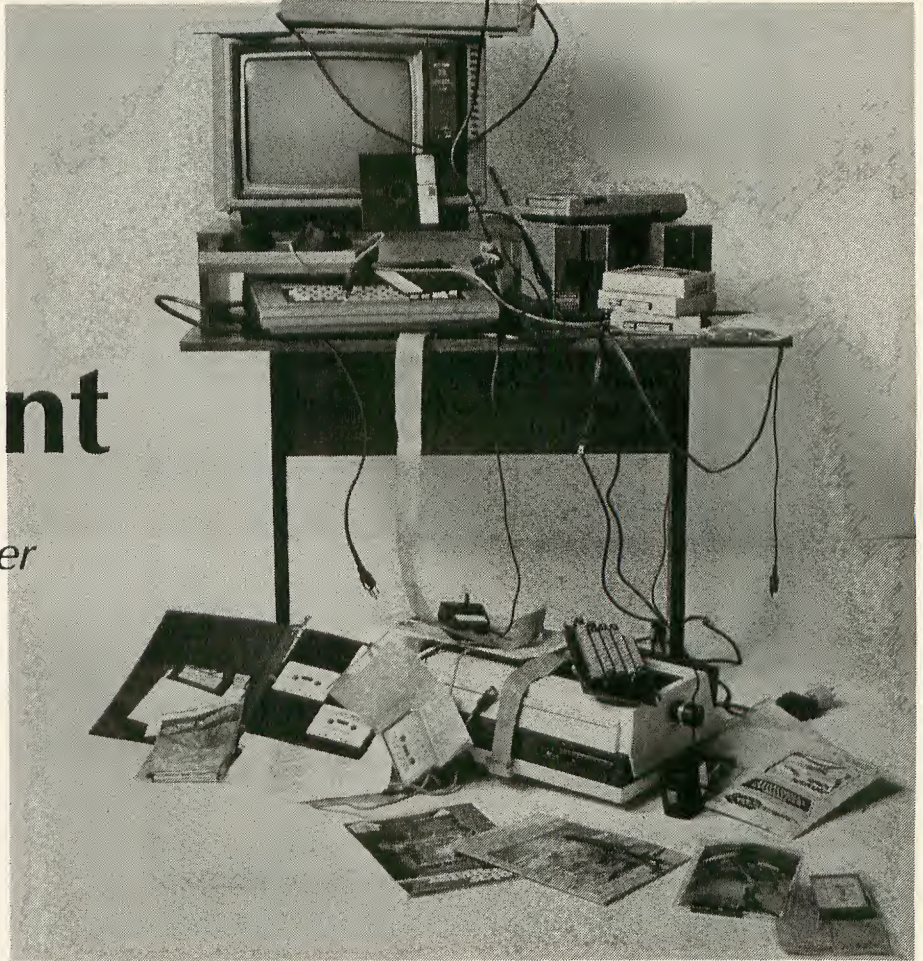
questions, find another company.

If the prices you receive from the mail order houses are 15–20% below the price of your local dealer after adding shipping and handling charges, then this will probably be your best buy. When considering mail order purchases over a dealer close to home, be convinced that servicing by mail will be handled quickly. A good buy can become a bad buy if you can't get good service.

I should say one thing about mail order. If you follow their instructions you will most likely get the product you ordered in a timely manner. I have never been cheated yet, and have made quite a few purchases his way.

Unless you know a great deal about computers and their peripherals, or you have a very good friend who doesn't mind reworking a piece of sophisticated electronics, stay away from sidewalk sales and bargain basement ads. Much of the equipment in these locations will be surplus, perhaps vintage, and most likely designed to work with equipment other than your new Color Computer.

Invest a little time and money checking out the equipment you want to buy and the dealer you will be buying from. It may cost a little more this way, but it will be worth it.



FAST, EFFICIENT
MACHINE LANGUAGE



NEW ARCADE GAMES

GLAXXONS / EL BANDITO / COSMIC CLONES

ARCADE GAMES

HAYWIRE / ASTRO BLAST / CAVE HUNTER / SPACE RAIDERS
ARCADE GAMES, CASSETTES 24.95—REQUIRE 16K / DISC 29.95—REQUIRES 34K

ADVENTURE GAMES

CALIXICO ISLAND / THE BLACK SANCTUM
ADVENTURE GAME CASSETTES 19.95—REQUIRES 16K

BUY FROM YOUR FAVORITE DEALER OR DIRECT FROM

MARK DATA PRODUCTS

24001 ALICIA PKWY., NO. 226, MISSION VIEJO, CA 92691 • (714) 768-1551

We pay shipping on all orders in the continental U.S. and Canada. Overseas add \$3.00. California residents, please add 6% sales tax. We accept MasterCard and VISA. We are always looking for quality machine language programs. Contact us for details.



Mark Data Products



Part II. Use assembly language to further your cartoonist leanings.

by William Barden Jr.

LAST MONTH WE CREATED a tireless animated character performing deep knee bends. The two programs used to exercise our blue unisex athlete were written in Basic, and focused on the Basic commands GET and PUT.

Aside from making minor improvements in the code of last month's second program,

such as more efficient string manipulation, there is no dramatic new Basic approach to speed up the animation frame rate.

There is, however, a great deal that can be done in assembly language. As a matter of fact, most successful games are written in assembly language.

Is assembly language that difficult to

learn? Yes, it is. I'm not going to tell you that you can learn it in eight hours — you can't. After 100 hours you *may* be able to write useful, high-speed subroutines that can be called from Basic. I'll show you one here.

The Color Computer assembly-language program in Listing 2 performs a GET/PUT to the area we've been using. This is our own GET/PUT, and is similar to a Basic GET/PUT. The program stores the 72 by 76 pixel (picture element) area into RAM memory and retrieves the area from RAM.

In this PMODE there are 128 picture elements horizontally by 192 vertically, for a total of 24,576 pixels. Each element is defined by 2 bits in the RAM memory graphics page, making a total of 49,152 bits to make up the graphics screen, or 6144 bytes.

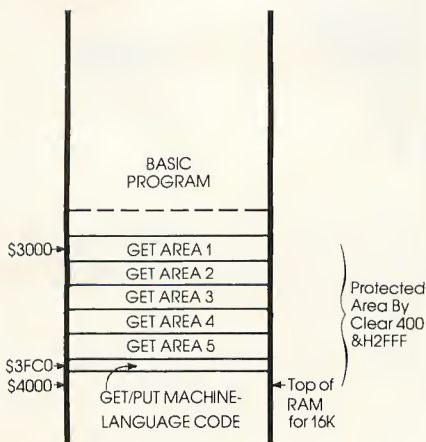
The area we're concerned with is 36 by 76, amounting to $36 \times 76 \times 2 = 5,184$ bits or 648 bytes. (The horizontal portion is 72 pixels wide, but in fact, only 36 PMODE 3 elements wide.)

The GET subroutine takes each of the 36 horizontal elements and stores them to nine bytes in high memory. This is done for 76 rows.

The PUT subroutine does the reverse. The 648 bytes from high memory are stored back into the display area, one row at a time for 76 rows.

The entire code is relocatable; it can be put anywhere in memory and work. We'll use the following scheme for using the assembly-language program, though (see Figure 1).

Figure 1. Assembly-Language program memory map.



We'll put the program itself from \$3FC0 on. This is decimal 16,320 (the \$ stands for hexadecimal representation).

We'll store the GET area in 700 bytes of memory starting at location \$3000 (decimal 12,288). There will be room for five separate GETs at \$3000 + 0, \$3000 + 700, \$3000 + 1400, \$3000 + 2100, and \$3000 + 2800.

Program Listing 1 shows a combination Extended Color Basic/assembly-language program using the GET/PUT assembly-language code. The machine-language code on the left side of Figure 1 has been stored into DATA statement values. If you look at the hexadecimal values in Program Listing 1, you'll see them replicated in the DATA values.

The Basic program first does a CLEAR 400,&H2FFF. This clears 400 bytes for string manipulation, but also protects the memory area used to store the machine-language program and GET data at \$3000 on. (The &H is the Basic equivalent of \$ for hexadecimal notation.)

The Basic program first READS each

DATA value and then moves the code to the \$3FC0 area. Next, the PMODE and SCREEN are set up.

Then, the strings are defined, as in the previous two programs.

The DEFUSR statements define the two machine-language subroutines at \$3FC0 and \$3FDB, respectively. The first is denoted USR subroutine 0 (the GET), and the second, USR subroutine 1 (the PUT).

Next five DRAWs and GETs are done, as in the second program from last month's article, shown here as Program Listing 3. The GET subroutine in assembly stores each figure, as before, but to the \$3000 RAM area rather than an array.

The animation portion of the program consists of eight GOSUBs in a loop, as in Listing 3. However, each PUT is a USR call to the PUT subroutine in assembly language.

The entire program is very similar to

Program Listing 1.

```

110 CLEAR 400,&H2FFF
120 DATA &HBD,&HB3,&HED,&H1F,&H01,&HCE,&H0F,&HBC
130 DATA &HC6,&H09,&HA6,&HC0,&HA7,&HB0,&H5A,&H26
140 DATA &HF9,&H33,&HCB,&H17,&H11,&HB3,&H19,&HC0,&H26,&HEE
150 DATA &H39,&HBD,&HB3,&HED,&H1F,&H01,&HCE,&H0F,&HBC
160 DATA &HC6,&H09,&HA6,&HB0,&HA7,&HC0,&H5A
170 DATA &H26,&HF9,&H33,&HCB,&H17,&H11,&HB3,&H19,&HC0,&H26
180 DATA &HEE,&H39
190 FOR I=&H3FC0 TO &H3FF5
200 READ A:POKE I,A
210 NEXT I
220 PMODE 3,1
230 SCREEN 1,0
240 PCLS
250 B$="R4;U4;H4;U4;E4;R8;F4;D4;G4;D4;R4;BD4;D16;BL16;U16;BU4;"
260 A1$="BR16;R8;D20;L4;U16;L4;BL16;L4;D16;L4;U20;R8;"
270 A2$="BR16;R8;F12;G3;H10;L7;BL16;L7;G10;H3;E12;R8;"
280 A3$="BR16;R24;D4;L24;BL16;L24;U4;R24;"
290 A4$="BR16;R7;E10;F3;G12;L8;BL16;L8;H12;E3;F10;R7;"
300 A5$="BR16;R4;U16;R4;D20;L8;BL16;L8;U20;R4;D16;R4;"
310 L1$="BD20;BR16;D28;R8;D4;L12;U28;L8;D28;L12;U4;R8;U28;BU20;"
320 L2$="BD20;BR16;F12;G12;R8;D4;L12;U6;E8;H4;L16;G4;F8;D6;L12;U
4;R8;H12;E12;BU20;"
330 L3$="BD20;BR16;R12;D4;G8;R4;D4;L12;U6;R4;E4;L24;F4;R4;D6;L12
;U4;R4;H8;U4;R12;BU20;"
340 DEFUSR0=&H3FC0:DEFUSR1=&H3FDB
350 DRAW "BM124,96;"
360 DRAW B$+A5$+L1$:PAINT (136,106),3,4
370 A=USR0(&H3000)
380 PCLS
390 DRAW B$+A4$+L1$:PAINT (136,106),3,4
400 A=USR0(&H3000+700)
410 PCLS
420 DRAW B$+A3$+L1$:PAINT (136,106),3,4
430 A=USR0(&H3000+1400)
440 PCLS
450 DRAW "BM+0,+4;" + B$+A2$+L2$+"BM+0,-4":PAINT (136,106),3,4
460 A=USR0(&H3000+2100)
470 PCLS
480 DRAW "BM+0,+16;" + B$+A1$+L3$+"BM+0,-16":PAINT (136,106),3,4
490 A=USR0(&H3000+2800)
500 PCLS
510 GOSUB 600
520 GOSUB 620
530 GOSUB 640
540 GOSUB 660
550 GOSUB 680
560 GOSUB 660
570 GOSUB 640
580 GOSUB 620
590 GOTO 510
600 A=USR1(&H3000)
610 RETURN
620 A=USR1(&H3000+700)
630 RETURN
640 A=USR1(&H3000+1400)
650 RETURN
660 A=USR1(&H3000+2100)
670 RETURN
680 A=USR1(&H3000+2800)
690 RETURN

```


the Basic GET/PUT example, except that we're using our "home-grown" GET/PUT.

How fast is it? (Sounds like a late evening talk show line...) Although I didn't time it exactly, it's somewhere around (uhhh...coronary...help!) 200 deep knee bends per minute (27 frames per second), more than twice as fast as in Listing 3. And that's why assembly-language is used for animation.

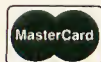
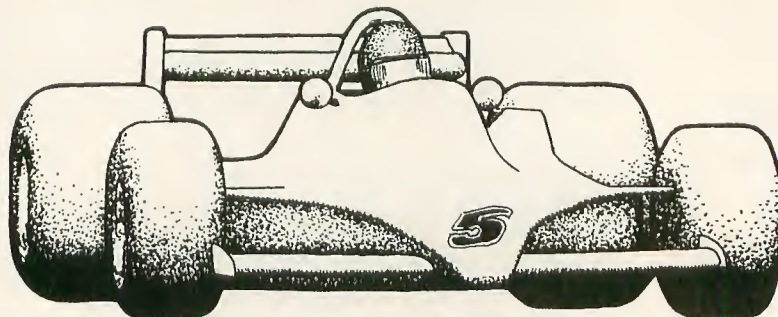
You're On Your Own

The Color Computer is great for graphics. There's plenty that can be done even if you don't use assembly language. Concentrate on learning how the GET/PUT works, and minimize the GET/PUT area for faster speeds. Use the most efficient code possible for graphics by pre-processing strings, multiple-statement lines, and the like. If you have the time and motivation, try your hand at assembly-language graphics. If graphics is your bag, you won't be disappointed with the investment.

Try hard enough and, you too, can be part of the elite corps of microcomputer game designers. Just keep your deep knee bends down below 100 per minute...

Program Listing 2.			
3FC0	00100	ORG	\$3FC0
	00110	*****	*****
	00120	* ASSEMBLY LANGUAGE GET/PUT SUBROUTINE	*
	00130	* CALLED FROM BASIC WITH ADDRESS OF BUFFER *	
	00140	*****	*****
	00150	START	EQU \$600+76*32+12 START OF SCREEN AREA
	00160	ENDLOC	EQU \$600+152*32+12 END OF SCREEN AREA
	00170	INTCNV	EQU \$B3ED INTEGER CONVERT
	00180	GET	JSR INTCNV FIND BUFFER LOCN
	00190	TFR	D,X NOW IN X
	00200	LDU	#START POINT TO SCREEN AREA
	00210	GET010	LDB #9 SET COLUMN COUNTER
	00220	GET020	LDA ,U+ GET BYTE FROM SCREEN
	00230	STA	,X+ STORE IN MEMORY
	00240	DECB	DECREMENT COL CNT
	00250	BNE	GET020 GO IF NOT 9 BYTES
	00260	LEAU	+23,U POINT TO NEXT ROW
	00270	CMPU	#ENDLOC HAS LAST BEEN DONE?
	00280	BNE	GET010 GO IF NO
	00290	RTS	RETURN
	00300	PUT	JSR INTCNV FIND BUFFER LOCN
	00310	TFR	D,X NOW IN X
	00320	LDU	#START POINT TO SCREEN AREA
	00330	GET030	LDB #9 SET COLUMN COUNTER
	00340	GET040	LDA ,X+ GET BYTE FROM MEMORY
	00350	STA	,U+ STORE IN SCREEN
	00360	DECB	DECREMENT COL CNT
	00370	BNE	GET040 GO IF NOT 9 BYTES
	00380	LEAU	+23,U POINT TO NEXT ROW
	00390	CMPU	#ENDLOC HAS LAST BEEN DONE?
	00400	BNE	GET030 GO IF NO
	00410	RTS	RETURN
	00420	END	
00000	TOTAL ERRORS		

YOUR COLOR COMPUTER JUST GOT WHEELS!



REVOLUTION!

REALISTIC...

Developed by an experienced race driver, *Revolution* reproduces the actual feeling of being behind the wheel of an authentic race car. Designed with the utmost attention to detail, its unprecedented measure of control turns your Color Computer into a challenging test of skill and precision. There are no funny monkeys, strange alien creatures or creeping oil slicks. *Revolution* pits you against yourself... competition in its purest form.

INNOVATIVE...

Revolution comes ready to run with a selection of cars and pre-designed courses. But unlike other computer and arcade games, its basic parameters can be changed by the player, making *Revolution* an unbeatable challenge.

SOPHISTICATED...


Revolution is fully menu driven and has fast, high resolution machine language graphics. PLUS, *Revolution* utilizes the advanced file access capabilities of the Color Computer to automatically store and retrieve all of your lap records and save the tracks you've designed.

A COMPUTER GAME AHEAD OF ITS TIME!

For 32K Disk
For 32K Cassette

\$24.95
\$21.95

Requires Joysticks
& Extended BASIC

Inter  Action

113 Ward Street • Dept. M • New Haven, CT 06519
(203) 562-5748

Program Listing 3.

```

110 CLEAR 400
120 DIM F1(0,160)
130 DIM F2(0,160)
140 DIM F3(0,160)
150 DIM F4(0,160)
160 DIM F5(0,160)
170 PMODE 3,1
180 SCREEN 1,0
190 PCLS
200 B$="R4;U4;H4;U4;E4;R8;F4;D4;G4;D4;R4;BD4;D16;BL16;U16;BU4;"
210 A1$="BR16;R8;D20;L4;U16;L4;BL16;L4;D16;L4;U20;R8;"
220 A2$="BR16;R8;F12;G3;H10;L7;BL16;L7;G10;H3;E12;R8;"
230 A3$="BR16;R24;D4;L24;BL16;L24;U4;R24;"
240 A4$="BR16;R7;E10;F3;G12;L8;BL16;L8;H12;E3;F10;R7;"
250 A5$="BR16;R4;U16;R4;D20;L8;BL16;L8;U20;R4;D16;R4;"
260 L1$="BD20;BR16;D28;R8;D4;L12;U28;L8;D28;L12;U4;R8;U28;BU20;"
270 L2$="BD20;BR16;F12;G12;R8;D4;L12;U6;E8;H4;L16;G4;F8;D6;L12;U
4;R8;H12;E12;BU20;"
280 L3$="BD20;BR16;R12;D4;G8;R4;D4;L12;U6;R4;E4;L24;F4;R4;D6;L12
;U4;R4;H8;U4;R12;BU20;"
290 DRAW "BM128,96;"
300 DRAW B$+A5$+L1$
310 PAINT (136,106),3,4:GET (101,76)-(172,151),F1
320 PCLS
330 DRAW B$+A4$+L1$
340 PAINT (136,106),3,4:GET (101,76)-(172,151),F2
350 PCLS
360 DRAW B$+A3$+L1$
370 PAINT (136,106),3,4:GET (101,76)-(172,151),F3
380 PCLS
390 DRAW "BM+0,+4;"+B$+A2$+L2$+"BM+0,-4"
400 PAINT (136,106),3,4:GET (101,76)-(172,151),F4
410 PCLS
420 DRAW "BM+0,+16;"+B$+A1$+L3$+"BM+0,-16;"
430 PAINT (136,106),3,4:GET (101,76)-(172,151),F5
440 PCLS
450 GOSUB 540
460 GOSUB 560
470 GOSUB 580
480 GOSUB 600
490 GOSUB 620
500 GOSUB 600
510 GOSUB 580
520 GOSUB 560
530 GOTO 450
540 PUT (101,76)-(172,151),F1
550 RETURN
560 PUT (101,76)-(172,151),F2
570 RETURN
580 PUT (101,76)-(172,151),F3
590 RETURN
600 PUT (101,76)-(172,151),F4
610 RETURN
620 PUT (101,76)-(172,151),F5
630 RETURN

```

Lowest Price Ever on the Professional Keyboard — \$69.95!

- No soldering, cutting, or gluing required — plugs right in!
- New, improved version — better layout, lighter touch. (See photo)
- High quality construction assures reliable operation.
- See review this issue, page 87.

Versakey — a Multifunction Keyboard Driver Utility — \$9.95

- Auto repeat, n-key rollover and type-ahead
- May define up to 128 strings of up to 80 characters each
- F1 functions as DEFINE, F4 as CTRL
- Supplied on cassette, may be copied to disk
- Assembly language source listing included

Introducing the Premium Keyboard — \$89.95

- Attractive low profile
- Extended Radio Shack layout
- Silk-smooth feel — uses ALPS keyswitches

Keyboards carry a 90-day limited warranty.
Include your computer's PC board type, if known.
Otherwise, include the complete catalog number and serial number.

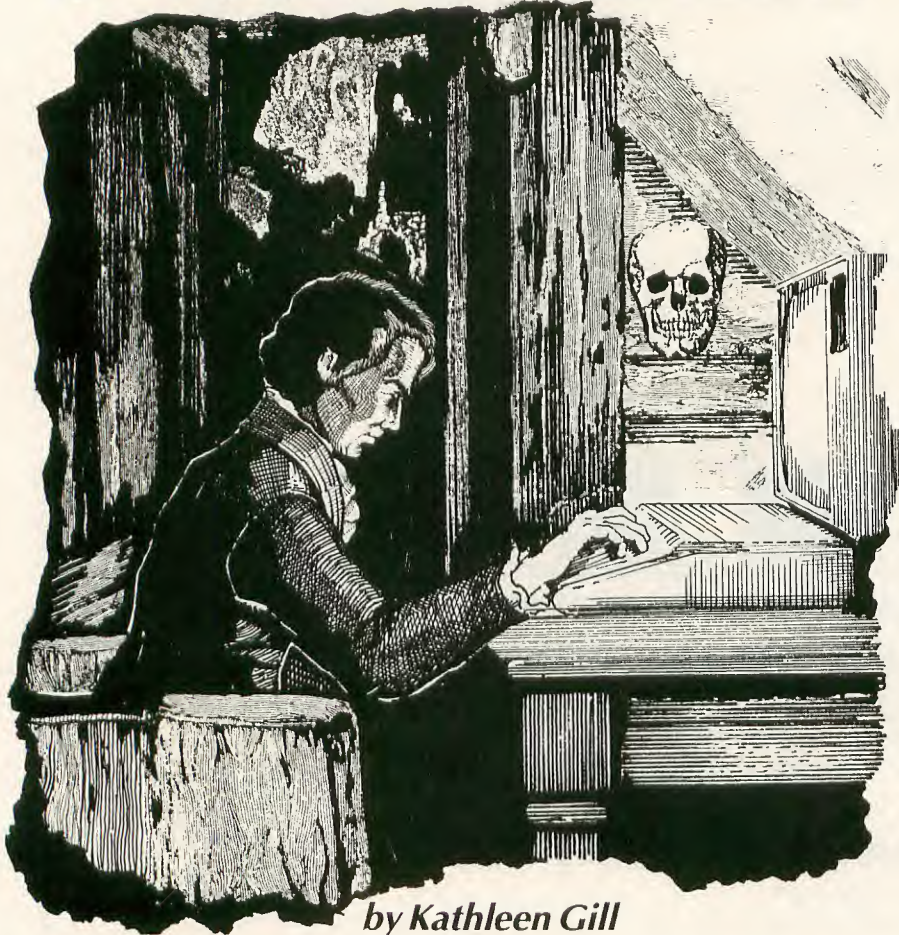


Micronix Systems Corporation

#7 Gibraltar Square
St. Charles, MO 63301
(314) 441-1694

Terms: Prepaid check or money order, Mastercard or Visa. Shipping Charges: U.S. \$2.00, Canada \$4.00, COD \$3.50 (No CODs to Canada).

How To Write Good Documentation



by Kathleen Gill

Your program's no good until people can understand how to use it.

HALLELUJAH! You've finally finished your programming masterpiece. Being a conscientious programmer, you've spent the last few weeks thoroughly debugging your program. And, modestly speaking, you believe it to be the best of its kind. Now all you have to do is get it published.

Wait. Didn't you forget something? How about the documentation? "Oh that!" you say with noticeable relief. *Should* be a piece of cake. After all, who knows the program better than you? The fact that you know the program so well is often a

problem when you write the instructions. How do you objectively write about something so close to you? You know your program inside and out, but after all that intimacy, you probably take

what it does (and how to make it do it) for granted.

Why Write Documentation?

Let's break for a moment to explain why you should be agonizing over the documentation. When the software industry began, there was a dearth of programs to publish. As a result, just about anything that would load and run was assured of publication. Today, the competition for publishing software is fierce — only one or two percent of the programs sent in are accepted for publication. Prerequisites for publishing a program, even a good program, have come a long way from two or three years ago. Most publishers have so many good programs already in the development process that they can afford to reject a new submission on the basis of poor or non-existent author documentation.

So, even if your program is a class act, good author documentation is no longer a plus — it's a necessity. An editor's first impression of your program will depend on whatever documentation you've included. You can't afford to assume the editor will instinctively know how to load your program and make it do everything it's supposed to when you've provided nothing more than a cover letter heralding your creation's benefits.

Another Reason

Perhaps you are now convinced that providing good author documentation can determine your program's fate. Here is yet another reason why you should take the time to include complete instructions with your submission.

Suppose your program is so great that even though the editor had to spend three days figuring out how to load it, he accepted your program. You signed the contract and in a month or two, a dozen copies of your program will be in every computer store in the country with your first royalty check arriving shortly.

Now, I know we're supposing here, but anyone who has had a program published knows that only two to three months development time is really stretching the imagination. In reality, your program (assuming it was bug-free and is now out of the technical department) is probably sitting in some overworked technical writer's IN basket. Again, this person has no idea what your program does other than what your sketchy cover letter stated. After loading

the program, it may take days (or weeks for a complex program) for the writer to learn the program inside and out. What a waste of time for both of you! If you had taken the time to write the kind of instructions your program deserved, it might have been collecting royalties for you instead of collecting dust on a documentation writer's desk.

"OK, OK" you say, "I believe in the power of good documentation, but where do I begin? What do I do?"

Organize!

The first rule of good documentation writing, or any writing, is organization. Before you begin, you need an outline. You may hate outlines but there's no way around it. You didn't sit down and start programming your masterpiece. You figured out what you wanted the program to do and then drew a flow-chart to outline how your program would execute that function. Basically, that's what you need to do with your documentation.

Identifying Your Audience

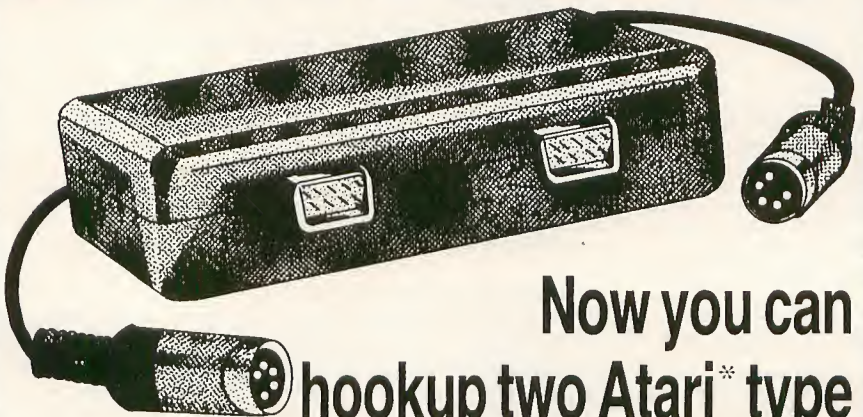
Before you start, here's an important question for you to ponder. Who is your audience? That answer depends upon your program. Successfully identifying your audience can make the writing easier. If you've written a utility, it's likely that programmers much like yourself will be using the program. So you can then assume they'll know what you mean when you talk about addresses. If your program is a data base manager, your audience will include everyone from housewives to plumbers, and if you mention addresses, they'll most likely think you mean street addresses rather than memory locations. You shouldn't have to explain the basics of bookkeeping for a professional accounting package; you can assume that users of this type of program will already be familiar with rudimentary bookkeeping. Try to anticipate what the majority of your audience will understand without underestimating their intelligence. (No one said this would be easy!)

Begin At The Beginning

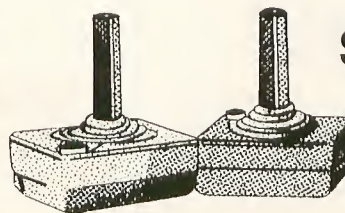
Good documentation is actually a series of beginnings, starting with the in-

Please turn the page

THE DOUBLE STICK INTERFACE*



Now you can
hookup two Atari* type
joysticks to your Color Computer
or TDP System-100 for only \$19.95.



\$39.95 — The interface with
two Atari* joysticks

*Interface made by WICO. Atari is
a registered trademark of Atari, Inc.

YES!

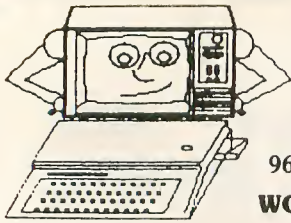
PLEASE SEND:

() INTERFACES... \$19.95
() STICK/INTERFACE SETS... \$39.95
All orders plus \$2 shipping
N.Y. residents add sales tax

NAME _____
ADDRESS _____
CITY, STATE, ZIP _____

SPECTRUM PROJECTS

93-15 86th DRIVE • WOODHAVEN, NY 11421
212-441-2807



INTERNATIONAL COLOR COMPUTER CLUB

Main Office
2101 E. Main St., Henderson, Texas 75652
Canadian Branch
96 Carleton Dr. Saskatoon, Saskatchewan S7H-3N6
WORLD'S LARGEST COLOR COMPUTER CLUB

HERE ARE SOME GOOD REASONS FOR JOINING

- 1). **FREE PROGRAMS.** Good programs written by our members are contained in the library, in the newsletter, and on the new member tape.
- 2). **NEWSLETTER.** A "magazine" sized newsletter (last issue 80 pages), with programs, tips, data, reviews, articles and much more.
- 3). **NEWSLETTER TAPE.** A tape of all the programs appearing in the newsletter is available from the library for \$2.00 (to members).
- 4). **CLUB LIBRARY.** The club maintains a library of programs, books and Radio Shack ROMpaks. The programs are member written and are yours to keep, there is a small fee to cover postage and tape (\$2.). The books and ROMpaks may be checked out for 3 weeks at a time (extensions possible).
- 5). **DISCOUNTS.** Get large discounts on many software and hardware items for CoCo from some of the MAJOR companies. Also discounts on subscriptions to the RAINBOW, CCN and Chromasette magazines.
- 6). **ADVERTISE FREE.** Members may place ads of up to 1/4 page per issue in the newsletter FREE. (The ad must be computer related.)
- 7). **BORROW PARTS.** Don't wait weeks for the parts to come in from Radio Shack! Just check them out of the Club's Parts library and return when yours arrive.
- 8). **SURPRISE.** You receive a "New member" package containing many useful items.
- 9). **GET HELP.** This is the world's largest Color Computer Club. With members in almost every field of expertise. So if you have a problem with the Color Computer, we can almost always get you the answer. Put your problem on the Club's Bulletin Board, write, or call.
- 10). **FIND FRIENDS.** As a new member, you will receive a list of the members in your area whom you may contact for CoCo talk.

HOW TO BECOME A MEMBER

Write to the club for an application, there are no conditions for membership other than agreeing to obey the rules, being interested and paying the dues. The membership dues are \$30.00 per year and we believe you get more than your moneys worth. You can save more than the \$30.00 in discounts the club offers you. Example: Subscription to the RAINBOW, 25% off of regular subscription rates. Some members have told me that the new member tape alone is worth the \$30. It contains 10, very good programs. Some of the programs contained in the library are, Accounts Receivable, General Ledger, Inventory, Sales file and ticket program with automatic Inventory update (for 32K with 2 disc.)

formation the user needs to run the program. How much memory does the program require? List the peripherals needed: How many disk drives? What kind of printer? Do you need a DOS to load the program? Is the program joystick compatible? Does it have sound? Include *all* the details and don't take any shortcuts. The publisher will find it easier to edit information out than to fill in the gaps. Make sure your manual is legible, neat, and double-spaced with wide margins.

Loading Instructions

This is the most critical part of your author documentation. Though it's likely the software company will use their own program loader once the program has been accepted, they must be able to load your program to review it. The only thing more frustrating than a program that won't load is trying to open one of those child-proof aspirin bottles when you have a splitting headache. At times like these, the author of the non-loading program is not thought too well of, and this annoyance is likely to color the user's attitude toward the entire program.

Using Your Outline

Here's where your outline begins to pay off. Unless you can organize exceptionally well in your head, go no further until you have completed one! Documentation that gives all the needed information is worthless if it isn't given where and when it's needed.

If you were lucky enough to have an English teacher who required you to write an "instructions to make a peanut butter and jelly sandwich," essay, remember how you really had to think to break down the steps necessary in this simple recipe. Hmmm, first you insert the knife in the jelly...no, first you open the jar...uhuh...get out the bread, then.... Remember, first things first! Your program user needs to know how to print the checks only after he knows how to enter the information that will be printed on them.

Your Introduction

Why does this program exist? What is its objective? Your introduction should include the answers to these questions. Even gamers want to know who the "Stareaters" are, where they came from and what will happen when they've wiped out every last one. Tell your mailing list program users the program's ben-

FOR TRS-80 COMPUTER OR TDP-100

EXECUTIVE GRAPHICS

can be used for serious graphic designs,
abstract art design, designing quilts or needlepoint
or simply hours of fun.

Capable of producing millions of multi-layered
geometrical designs.

Displays can be saved on tape, printer or disc.
Draws lines, circles, dots, boxes, triangles at will.

Menu driven and user friendly.
Designer has total control at all times.

\$14.95 plus \$1.50 S & H

Send check/money orders to:

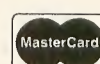
Lighthouse Data Systems

821 Ocean Ave.
Portland, ME 04103

All orders except personal checks shipped within 24 hours.

No CODs please

SOFTWARE AUTHORS WANTED



efits and it's limitations. Summarize here, don't get too lengthy. You'll be telling them *how* to do it later.

Your introduction should pave the way for the next section of the manual, a detailed look at the program elements.

For a game, list the items involved. Identify the types of craft and weapons, their effects and point values. Don't lump your information into paragraphs. Use sections and subsections with clearly marked headings, and charts and tables whenever you can.

In business, application, and utility programs, examples are an absolute necessity and provide an easy teaching method. Anticipate errors and let the user know how to correct them. As you continue through this section, always remember not to get ahead of the user. Your instructions should follow the pattern of the program's use.

Wrapping It Up

When you've included all that you can without repeating yourself, it's time to wrap it up. Your last section should contain any technical instructions for modifying the program, or patches for using it with other programs. Now is a good time to write a table of contents. If your manual is lengthy, you might consider an index or ask the publisher to include one when your program is published.

Remember, even though the software house is publishing your program, you are the author and the creator. Follow the program's development closely, and make your interest clear. It's likely that any documentation editor will be happy to work with you on the final manual if you show you care. At the very least, you should have an opportunity to proof the finished manuscript before it's printed.

In so short a space, it's impossible to cover everything necessary to produce the best in documentation. But, if you realize the importance of good documentation and follow the information given here, you'll find the difference it can make in your program's chances for success is definitely worth the time and effort.

This article was written with software publication in mind, but the same rules apply for articles submitted to us for magazine publication. Your program stands a better chance of publication if accompanied by complete understandable documentation. See END OF FILE (GOTO 96) for excerpts from The Color Computer Magazine's writers guidelines.

— Eds.

The Original FLEX for Color Computers

- * Upgrade to 64K
- * RS to FLEX, FLEX to RS file transfer ability
- * Create your own character set
- * Automatic recognition of single or double density and single or doubled sided
- * All features available for either single or multiple drive systems
- * Settable Disk Drive Seek Rates
- * Faster High Resolution Video Display with 5 different formats
- * Save RS Basic from RAM to Disk
- * Move RS Basic to RAM
- * Load and save function on FLEX disk
- * 13 Support Commands 8 with Source Text

Languages Available

Pascal, Fortran, RS Basic, RS Assembler, TSC Basic, TSC Assembler, Relocating Assembler, Macro Assembler, Mumps

If you are tired of playing games on your TRS-80™ Color Computer, or find that you are handicapped by the limitations of the RS BASIC in trying to write a Program that will allow you to actually USE the Color Computer as a COMPUTER, YOU ARE READY TO MOVE UP TO THE FLEX9™ Operating System. If you want to have REAL PROGRAMMING POWER, using an Extremely Powerful Business BASIC, PASCALS, C Compilers, a full-blown Macro Assembler with a Library capability so you are not continuously "reinventing the wheel", YOU ARE READY TO MOVE UP TO THE FLEX9™ Operating System. If you would like to see if YOU REALLY COULD USE A COMPUTER IN YOUR BUSINESS, or begin to make your Computer start PAYING IT'S OWN WAY by doing some Computer Work for the millions of small business around you, such as Wordprocessing, Payroll, Accounting, Inventory, etc., then YOU ARE READY TO MOVE UP TO THE FLEX9™ Operating System. How?? DATA-COMP has the way!

DATA-COMP's FLEX9™ Conversion for the TRS-80™ Color Computer was designed for the SERIOUS COMPUT-

ER USER; with features like greatly increased Display Screens, WITH Lower Case Letters, you can put a FULL Menu on ONE Screen, or see SEVERAL Paragraphs at the same time; with features like providing a FULL Keyboard so you have FULL Control of your Computer AND it's Programs NATURALLY, without needing a chart to see what Key Combination will give you what function; with USER ORIENTED functions to make using the Operating System natural, like having the Computer AUTOMATICALLY determine what type of Disk is being used in what type of Disk Drive and working accordingly, rather than you have to specify each and every thing for it, or like having the Computer work with the Printer you have been using all along without you having to tell the new Operating System what is there; etc., etc., etc.

DATA-COMP has everything you need to make your TRS-80™ Color Computer WORK for YOU; from Parts and Pieces to Full, Ready To Use SYSTEMS. DATA-COMP designs, sells, services, and SUPPORTS Computer SYSTEMS, not just Software. CALL DATA-COMP TODAY to make your Computer WORK for YOU!

System Requirements

FLEX9 Special General Version w/Editor & Assembler (which normally sell for \$50.00 ea.)	\$150.00
F-MATE(RS) FLEX9 Conversion Route, for the RS Disk Controller	
when purchased with Special General FLEX9 Sys.	\$49.95
when purchased without the General FLEX9 Sys.	\$59.95
Set of Eight 64K RAM Chips w/Mod. Instructions	\$59.95
Color Computer with 64K RAM and EXT. BASIC	\$399.95
Radio Shack Disc Controller w/manual	\$179.95

Now Available

Enhanced F-MATE Version 2.1

SPECIAL SYSTEMS PACKAGES

64K Radio Shack COLOR COMPUTER, Radio Shack COLOR DISK CONTROLLER, a Disk Drive System, Special General Version of FLEX9™, F-MATE(RS)™ and a Box of 10 Double Density Diskettes; a COMPLETE, ready to run SYSTEM on your Color TV Set.

\$1079.95

FREE with F-MATE
External Terminal Program

DATA-COMP P.O. Box 794 HIXSON, TN 37343 1-615-842-4601

TRS-80C* and TDP 100* SPECIALISTS

COLORFORTH*

IS THERE LIFE AFTER BASIC? Yes! with COLORFORTH, a new, high level language for the color computer. COLORFORTH, a figFORTH compiler, has an execution time as much as 10 to 20 times faster than Basic, and can be programmed faster than Basic. COLORFORTH is highly modular for easy testing and debugging. COLORFORTH has been specially customized for the color computer and requires only 16K. It does not require Extended Basic. When you purchase COLORFORTH, you receive both cassette and RS/DISK versions, the figEDITOR and an extensive instruction manual. Both versions and 75 page manual, all for only \$49.95

PCFORTH

FORTH for the IBM PC* and Zenith Z-100*. All the features of COLORFORTH, but customized for the IBM and Zenith Z-100 personal computers. Requires 32K and MS/DOS or IBM/PCDOS. On 5-1/4" SSDD diskette. Complete with 75 page manual, just \$59.95

NEW!

MASTER MIXOLOGIST* The Bartenders' Guide

This disk based program for the color computer contains recipes for over 150 of your favorite bar drinks—both alcoholic and non-alcoholic. MASTER MIXOLOGIST is menu driven for ease of use. Requires 16K and one RS/DOS drive. Get this one today, it will be great for your next party \$19.95

ARMADILLO BUG* MACHINE LANGUAGE MONITOR

More and more programs are appearing in magazines written in Machine Language. Now with ARMADILLO BUG, you can easily enter Machine Language programs without a lot of time consuming "pokes". ARMADILLO BUG is an excellent system for beginners to learn to write and debug their own Machine Language programs as well. This package includes: Memory examine and change; Move; Punch and Load; Fill commands; and more! Runs in 16K, and DOES NOT require Extended Basic. Complete on cassette with printed manual. Just \$14.95

COLOR BIORHYTHMS

This is a neat BIORHYTHMS program you can use to chart the future (or past). Includes High Resolution graphics without Extended Basic being required. Runs in 16K. On cassette, with instructions \$10.95

DEALER and AUTHOR INQUIRES INVITED

Please add \$2.00 shipping in U.S.
Foreign orders must be in U.S. funds drawn on U.S. banks, or Mastercard and VISA

Texas residents add 5 %

ARMADILLO INT'L SOFTWARE

P.O. BOX 7661
AUSTIN, TEXAS 78712



PHONE (512) 835-1088

Restaurant At The End

(Chapter 3, an excerpt from the novel)

A Nutri-Matic vending machine and the Heart of Gold's onboard computer team up to brew Arthur Dent a cup of tea. Meanwhile the Vogons are attacking . . .

by Douglas Adams



From *THE RESTAURANT AT THE END OF THE UNIVERSE* by Douglas Adams. Reprinted by permission of Harmony Books, a division of Crown Publishers, Inc. Published in Canada by Collins Publishers. Copyright © 1980 by Douglas Adams.

Does anyone have a kettle?" Arthur asked as he walked on to the bridge, and instantly began to wonder why Trillian was yelling at the computer to talk to her, Ford was thumping it and Zaphod was kicking it, and also why there was a nasty yellow lump on the vision screen.

He put down the empty cup he was carrying and walked over to them.

"Hello?" he said.

At that moment Zaphod flung himself over to the polished marble surfaces that contained the instruments that controlled the conventional photon drive. They materialized beneath his hands and he flipped over to manual control. He pushed, he pulled, he pressed and he swore. The photon drive gave a sickly shudder and cut out again.

"Something up?" said Arthur.

"Hey, didja hear that?" muttered Zaphod as he leaped now for the manual

controls on the Infinite Improbability Drive, "the monkeyspoke!"

The Improbability Drive gave two small whines and then also cut out.

"Pure history, man," said Zaphod, kicking the Improbability Drive, "a talking monkey!"

If you're upset about something..." said Arthur.

"Vogons!" snapped Ford. "We're under attack!" Arthur gibbered.

"Well, what are you doing? Let's get out of here!"

"Can't. Computer's jammed."

Jammed?"

"It says all its circuits are occupied. There's no power anywhere in the ship."

Ford moved away from the computer terminal, wiped a sleeve across his forehead and slumped back against the wall.

"Nothing we can do," he said. He glared at nothing and bit his lip.

When Arthur had been a boy at school, long before the Earth had been demolished, he had used to play football. He had not been at all good at it, and his particular speciality had been scoring own goals in important matches.

Whenever this happened he used to experience a peculiar tingling round the back of his neck that would slowly creep up across his cheeks and heat his brow. The image of mud and grass and lots of little jeering boys flinging it at him suddenly came vividly to his mind at this moment.

A peculiar tingling sensation at the back of his neck was creeping up across his cheeks and heating his brow.

He started to speak, and stopped.

He started to speak again and stopped again.

Finally he managed to speak.

"Er," he said. He cleared his throat.

"Tell me," he continued, and said it so nervously that the others all turned to stare at him. He glanced at the approaching yellow blob on the vision screen.

"Tell me," he said again, "did the computer say what was occupying it? I just ask out of interest..."

Their eyes were riveted on him.

"And, er... well, that's it really, just asking."

Zaphod put out a hand and held Arthur by the scruff of the neck.

Of The Universe



"What have you done to it, Monkeyman?" he breathed.

"Well," said Arthur, "nothing in fact. It's just that I think a short while ago it was trying to work out how to..."

"Yes?"

"Make some tea."

"That's right, guys," the computer sang out suddenly, "just coping with that problem right now, and wow, it's a biggy. Be with you in a while." It lapsed back into a silence that was only matched for sheer intensity by the silence of the three people staring at Arthur Dent.

As if to relieve the tension, the Vogons chose that moment to start firing. The ship shook, the ship thundered. Outside, the inch thick force shield around it blistered, crackled and spat under the barrage of a dozen 30-Megahurt Definit-Kil Photrazon Cannon, and looked as if it wouldn't be around for long. Four minutes is how long Ford Prefect gave it.

"Three minutes and fifty seconds," he said a short while later.

"Forty-five seconds," he added at the appropriate time. He flicked idly at some

useless switches, then gave Arthur an unfriendly look.

"Dying for a cup of tea, eh?" he said.

"Three minutes and forty seconds."

"Will you stop counting!" snarled Zaphod.

"Yes," said Ford Prefect, "in three minutes and thirty-five seconds."

Aboard the Vagon ship, Prostetnic Vogon Jeltz was puzzled. He had expected a chase, he had expected an exciting grapple with tractor beams, he had expected to have to use the specially installed Sub-Cyclic Normality Asert-i-Tron to counter the *Heart of Gold's* Infinite Improbability Drive, but the Sub-Cyclic Normality Assert-i-Tron lay idle as the *Heart of Gold* just sat there and took it.

A dozen 30-Megahurt Definit-Kil Photrazon Cannon continued to blaze away at the *Heart of Gold*, and still it just sat there and took it.

He tested every sensor at his disposal to see if there was any subtle trickery afoot, but no subtle trickery was to be found.

He didn't know about the tea of course.

Nor did he know exactly how the oc-

cupants of the *Heart of Gold* were spending the last three minutes and thirty seconds of life they had left to spend.

Quite how Zaphod Beeblebrox arrived at the idea of holding a seance at this point is something he was never quite clear on.

Obviously the subject of death was in the air, but more as something to be avoided than harped upon.

Possibly the horror that Zaphod experienced at the prospect of being reunited with his deceased relatives led on to the thought that they might just feel the same way about him and, what's more, be able to do something about helping to postpone this reunion.

Or again it might just have been one of the strange promptings that occasionally surfaced from that dark area of his mind that he had inexplicably locked off prior to becoming President of the Galaxy.

"You want to talk to your great-grandfather?" boggled Ford.

"Yeah."

"Does it have to be *now*?"

The ship continued to shake and thunder. The temperature was rising. The light was getting dimmer—all the energy the computer didn't require for thinking about tea was being pumped into the rapidly fading force field.

"Yeah!" insisted Zaphod. "Listen, Ford, I think he may be able to help us."

"Are you sure you mean *think*? Pick your words with care."

"Suggest something else we can do."

"Er, well..."

"Okay, round the central console. Now. Come on! Trillian, Monkeyman, move."

They clustered round the central console in confusion, sat down and, feeling exceptionally foolish, held hands. With his third hand Zaphod turned off the lights.

Darkness gripped the ship.

Outside, the thunderous roar of the Definit-Kil Cannon continued to rip at the force field.

"Concentrate," hissed Zaphod, "on his name."

"What is it?" asked Arthur.

"Zaphod Beeblebrox the Fourth."

"What?"

"Zaphod Beeblebrox the Fourth. Concentrate!"

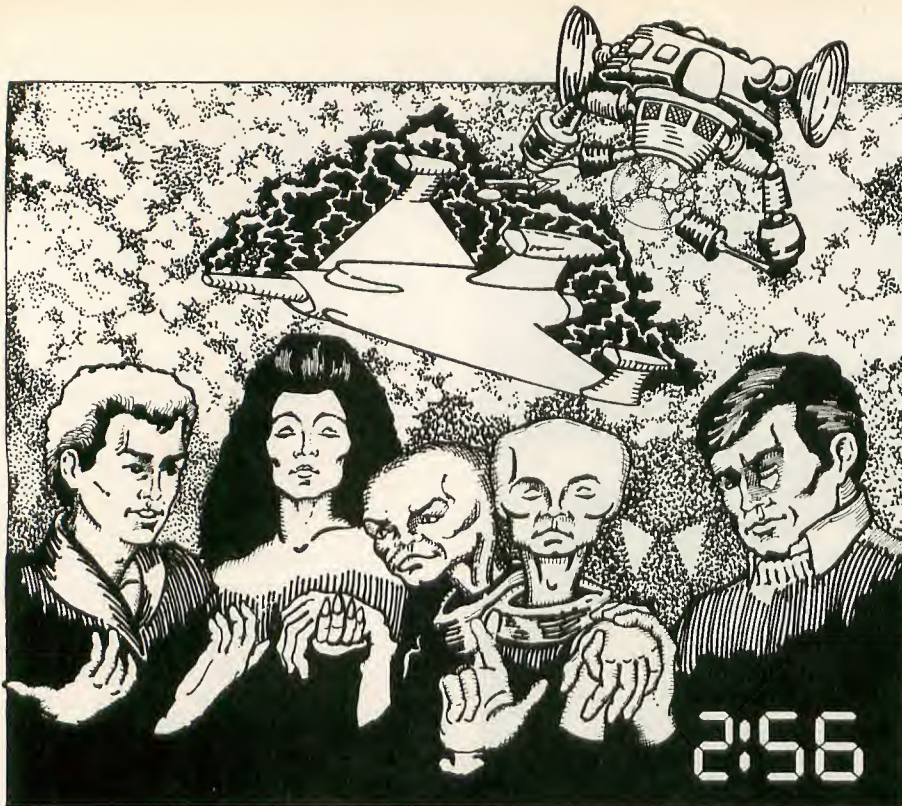
"The Fourth?"

"Yeah. Listen, I'm Zaphod Beeblebrox, my father was Zaphod Beeblebrox the Second, my grandfather Zaphod Beeblebrox the Third..."

"What?"

"There was an accident with a contraceptive and a time machine. Now concentrate!"

"Three minutes," said Ford Prefect.



"Why," said Arthur Dent, "are we doing this?"

"Shut up," suggested Zaphod Beeblebrox.

Trillian said nothing. What, she thought, was there to say?

The only light on the bridge came from two dim red triangles in a far corner where Marvin the Paranoid Android sat slumped, ignoring all and ignored by all, in a private and rather unpleasant world of his own.

Round the central console four figures hunched in tight concentration trying to blot from their minds the terrifying shuddering of the ship and the fearful roar that echoed through it.

They concentrated.

Still they concentrated.

And still they concentrated.

The seconds ticked by.

On Zaphod's brows stood beads of sweat, first of concentration, then of frustration and finally of embarrassment.

At last he let out a cry of anger, snatched back his hands from Trillian and Ford and stabbed at the light switch.

"Ah, I was beginning to think you'd never turn the lights on," said a voice. "No, not too bright please, my eyes aren't what they once were."

Four figures jolted upright in their seats. Slowly they turned their heads to look, though their scalps showed a distinct propensity to try and stay in the same place.

"Now. Who disturbs me at this time?" said the small, bent, gaunt figure standing by the sprays of fern at the far end of the bridge. His two small wispy-haired

heads looked so ancient that it seemed they might hold dim memories of the birth of the galaxies themselves. One lolled in sleep, the other squinted sharply at them. If his eyes weren't what they once were, they must once have been diamond cutters.

Zaphod stuttered nervously for a moment. He gave the intricate little double nod which is the traditional Betelgeusian gesture of familial respect.

"Oh... er, hi Great-granddad...." he breathed.

The little old figure moved closer toward them. He peered through the dim light. He thrust out a bony finger at his great grandson.

"Ah," he snapped, "Zaphod Beeblebrox. The last of our great line. Zaphod Beeblebrox the Nothingth."

"The First."

"The Nothingth," spat the figure. Zaphod hated his voice. It always seemed to him to screech like fingernails across the blackboard of what he liked to think of as his soul.

He shifted awkwardly in his seat.

"Er, yeah," he muttered. "Er, look, I'm really sorry about the flowers, I meant to send them along, but you know, the shop was fresh out of wreaths and...."

"You forgot!" snapped Zaphod Beeblebrox the Fourth.

"Well..."

"Too busy. Never think of other people. The living are all the same."

"Two minutes, Zaphod," whispered Ford in an awed whisper.

Zaphod fidgeted nervously.

"Yeah, but I did mean to send them,"

he said. "And I'll write to my great-grandmother as well, just as soon as we get out of this...."

"Your great-grandmother," mused the gaunt little figure to himself.

"Yeah," said Zaphod, "er, how is she? Tell you what, I'll go and see her. But first we've just got to..."

"Your *late* great-grandmother and I are very well," rasped Zaphod Beeblebrox the Fourth.

"Ah. Oh."

"But very disappointed in you, young Zaphod...."

"Yeah, well..." Zaphod felt strangely powerless to take charge of this conversation, and Ford's heavy breathing at his side told him that the seconds were ticking away fast. The noise and the shaking had reached terrifying proportions. He saw Trillian's and Arthur's faces white and unblinking in the gloom.

"Er, Great-grandfather..."

"We've been following your progress with considerable despondency..."

"Yeah, look, just at the moment you see..."

"Not to say contempt!"

"Could you sort of listen for a moment...?"

"I mean what exactly are you doing with your life?"

"I'm being attacked by a Vagon fleet!" cried Zaphod. It was an exaggeration, but it was his only opportunity so far of getting the basic point of the exercise across.

"Doesn't surprise me in the least," said the little old figure with a shrug.

"Only it's happening right now, you see," insisted Zaphod feverishly.

The spectral ancestor nodded, picked up the cup Arthur Dent had brought in and looked at it with interest.

"Er... Great-granddad—"

"Did you know," interrupted the ghostly figure, fixing Zaphod with a stern look, "that Betelgeuse Five has now developed a very slight eccentricity in its orbit?"

Zaphod didn't and found the information hard to concentrate on what with all the noise and the imminence of death and so on.

"Er, no... look," he said.

"Me spinning in my grave!" barked the ancestor. He slammed the cup down and pointed a quivering, sticklike see-through finger at Zaphod.

"Your fault!" he screeched.

"One minute thirty," muttered Ford, his head in his hands.

"Yeah, look Great-granddad, can you actually help because..."

"Help?" exclaimed the old man as if

Please turn to page 44



Color Computer Collection

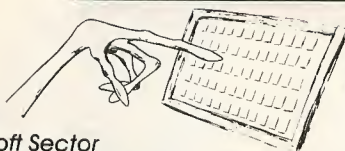


E.T.T.

From Soft Sector

NEW — Extra Terrestrial Typing — Those famous fingers are familiar — none other than E.T.! His sensitive five fingers expertly tutor from novice to expert. You couldn't ask for a friendlier teacher — watch closely as E.T. points the way.

16K Tape, \$19.95



CATERPILLAR

From Soft Sector Marketing

This is the fast-action arcade game you've been waiting to play at home! You must hit mushrooms and caterpillars — segment by segment — moths and tumble bugs. The challenges: they are all moving; when hit they split into additional segments or metamorphose into different shapes; when you destroy a caterpillar, the new one that replaces it is a segment longer than the original!

16K Tape, \$19.95



VOYAGER I

From Avalon Hill

You're on board a spaceship infested with killer robots in this graphic science fiction game. You must clear the 4-level 144-location ship of robots and arm it to self-destruct. Can you do it and escape before you, too, are blown up? High-speed graphics are represented in 3-D perspective representing your eye's view; with instant switching to floor plan maps. Extended BASIC required.

16K Tape, \$19.95

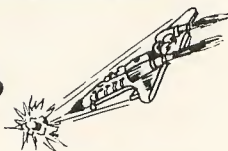


COLOR ZAP

By Frank Smith
From Spectral

Super space game written in machine language with highest resolution graphics. Avoid the incoming photon torpedoes as defensive fighters appear and attack your ship. Guaranteed fun and fast action. Zap the enemy! Joystick required.

16K Tape, \$9.95



NEVER BEFORE!

Never before have there been **COLOR DISKS!** Never before have we advertised **blank DISKS!** But these are so special...

INTRODUCING COLOR DISKETTES



Bright and bold! Premium quality mini diskettes in 5 brilliant colors: red, orange, yellow, blue, green. Single sided, soft sector, double density with hub rings. Use them just for beauty or to color code your programs and data!

Box of 10 — all one color or

Box of 10 — 2 each color

\$34.50 Box

3 D TIC-TAC-TOE



By Scott Adams

From Adventure International

A real family favorite with 8 separate skill levels. Use four 4X4 boards stacked one atop the other for Tic-Tac-Toe you never imagined. This real-time game features sound, optional joystick and the challenge and excitement to thrill your friends and family.

16K Tape, \$14.95



DRAGONQUEST

By Charles Forsythe
From Programmer's Guild

Search for the Monarch of Dragonfolk in a desperate race against the sun. You, Sir Knight, must rescue and return the kidnapped Princess before nightfall. Find the weapons, food and magical items you need while exploring unfamiliar lands in this magnificent machine language adventure. Can you vanquish Smaegor and beat the setting sun? Extended basic required.

16K Tape, \$15.95

WAR KINGS

From Tom Mix

A challenge game for two with three skill levels. Battle to save your King and Castle. Not only can you protect your castle by moving your shields, but you can deflect the cannonball towards an opponent's castles. High resolution graphics and outstanding sound. Requires extended basic and joysticks.

16K Tape, \$19.95



SOLO POOL

From Tom Mix

Now, play pool on your Color Computer! Even without a cuestick you can be an expert. Play against the computer or a friend. With multiple skill levels, this is a game the entire family can play and enjoy! Shoot in super color. Extended basic required.

16K Tape, \$17.95



TREK 16

By C. Roslund

From Tom Mix

An outstanding adventure with screen display. Journey through space aboard the Starship Enterprise with all the familiar characters. Not for the amateur — requires the cunning of Captain Kirk and the logic of Mr. Spock. Extended basic required. Happy trekking!

16K Tape, \$19.95



PROTECTORS

From Tom Mix Software

You have 4 ships armed with laser cannon and smart bombs. They have waves of enemy fighters; their mother ships have lasers and heat-seeking mines. Get a new ship for each 5,000 points you score. Exciting arcade action with hi res 4-color graphics.

32K Tape, \$24.95



COLORPEDES

From Intracolor

Try to keep up with the Colorpedes! Keep moving for quick scoring, smooth and accurate controls and fast action play with arcade quality sound effects. Keep your eyes on the high resolution, multicolored characters on the black background. Not just another game — this is a real escapade!

16K Tape, \$29.95



Over 2500 Programs for TRS-80,

ATARI 400/800, APPLE, IBM & VIC 20.

For Information Call
202-363-9797

THE PROGRAM STORE T.M.

To Order Call Toll-Free
800-424-2738

Visit our other stores:

829 Bethel Rd., Columbus OH
Seven Corners Center, Falls Church, VA
W. Bell Plaza, 6600 Security Blvd., Baltimore, MD
White Flint Mall, Rockville Pike, Rockville, MD.

Coming Soon to Boston,
Philadelphia and Pittsburgh.

MAIL ORDERS: Send check or M.O. for total purchase price, plus \$2.00 postage & handling. D.C., MD: & VA.: add sales tax. Charge cards: Include all embossed information.

© 1982 The Program Store, Inc.



THE PROGRAM STORE • Dept. 07-06-3 • Box 9582 • 4200 Wisconsin Ave., N.W., Washington, D.C. 20016

Item	Tape/Disk/Book	Price	Postage \$2.00	Name
			Total	Address
			<input type="checkbox"/> CHECK <input type="checkbox"/> VISA	City State Zip
			<input type="checkbox"/> MASTERCARD	Card # Exp
			Computer	


AT LAST

Real Arcade Joysticks For Co-Co

Just plug in our adaptor (below) and use your ATARI® joystick or for REAL ARCADE action... get one of ours!

Made by WICO®

COMMAND CONTROL adaptor 19⁹⁵




- Radio Shack® TRS80® Color Computer
- Uses one or two joysticks
- Adaptor needed for all joysticks

COMMAND CONTROL joysticks


- Injection-molded modular construction and 6 leaf-type molded switches — identical to the best commercial arcade models.
- Two fire button locations, activated by a base-mounted slide switch.
- Extra-long 5' cord.

Joystick 15-9714 29⁹⁵




- Extra-long arcade-style bat handle grip that moves smoothly and easily into all 8 standard positions.
- Low-profile, heavy-duty plastic base.

Famous Red Ball™ Joystick 15-9730 34⁹⁵



- Arcade-type red ball handle that moves smoothly and easily into all 8 standard positions.
- Low-profile, heavy-duty plastic base.


COMMAND CONTROL trackballs 65⁹⁵



- Features injection-molded modular construction.
- Phenolic ball provides unique 360 degree movement to an infinite number of positions; can also be used to vary the speed of on-screen objects.

TRIGA-COMMAND JOYSTICKS

\$19⁹⁵ ea/34⁹⁵ pr



SOFTWARE

FROM SHELL

DEATHSTAR "an adventure" 32k/ecb \$19.95
a text adventure that's different!!
(See review in April Issue of Rainbow)

STAR RAID "arcade type" 16k/ecb... \$18.95
a lot of action for 16k

FEDERATION BOOTCAMP 16k/ecb... \$18.95
You've been drafted for 16 wks.
of rugged training! can you
become a "space cadet"???

SONAR SEARCH "arcade type" 16/ecb \$18.95
remember battleship?? you'll
love this one! 1/2 players

EXTERMINATOR "arcade type" 16k/ecb \$18.95
not a "centipede type game"
this is original! destroy
the insects with your can
of "RAID" - lots of fun!

SNOOPY & RED BARON "arcade type" \$18.95
16k/ecb - this one is a real
"dog fight" for 2 players only!

LUNAR-lander "arcade type" 16k/ecb \$15.95
yep, another "lander" game but
we think you'll like our version.
Different each time with 4 levels
of play! Great Effects!!

SPECIAL ZAXXON by Datasoft 32k \$39.95

IF IT'S NOT GOOD, WE DON'T SELL IT
DEALER INQUIRIES WELCOME

* ALL ARCADE TYPE IN HI-RES *

\$
\$

FREE 16K Adv. game with \$50 order
Orders under \$50 add \$2.50 ship/hnd.
Write for other software available.

VISA/MC, CK, MO
9 to 5 EST (305) 884-1887

S & S ARCADE SUPPLIES

8301 Sarnow Dr. / Orlando FL 32807
Ph: (305) 275-8400 Evenings
-Fla. res. add 5% sales tax-
VISA/MC add 3%



he'd been asked for a weasel.

"Yeah, help, and like, now, because otherwise..."

"Help!" repeated the old man as if he'd been asked for a lightly grilled weasel in a bun with French fries. He stood amazed.

"You go swanning your way round the Galaxy with your"—the ancestor waved a contemptuous hand—"with your disreputable friends, too busy to put flowers on my grave, plastic ones would have done, would have been quite appropriate from you, but no. Too busy. Too modern. Too skeptical—till you suddenly find yourself in a bit of a fix and come over suddenly all astrally minded!"

He shook his head—carefully, so as not to disturb the slumber of the other one, which was already becoming restless.

"Well, I don't know, young Zaphod," he continued, "I think I'll have to think about this one."

"One minute ten," said Ford hollowly. Zaphod Beeblebrox the Fourth peered at him curiously.

"Why does that man keep talking in numbers?" he said.

"Those numbers," said Zaphod tersely, "are the time we've got left to live."

"Oh," said his great-grandfather. He grunted to himself. "Doesn't apply to me, of course," he said and moved off to a dimmer recess of the bridge in search of something else to poke around at.

Zaphod felt he was teetering on the edge of madness and wondered if he shouldn't just jump over and have done with it.

"Great-grandfather," he said, "it applies to us! We are still alive, and we are about to lose our lives."

"Good job too."

"What?"

"What use is your life to anyone? When I think of what you've made of it the phrase 'pig's ear' comes irresistibly to mind."

"But I was President of the Galaxy, man!"

"Huh," muttered his ancestor. "And what kind of a job is that for a Beeblebrox?"

"Hey, what? Only President you know! Of the whole Galaxy!"

"Conceited little megapuppy."

Zaphod blinked in bewilderment.

"Hey—er, what are you at, man? I mean Greatgrandfather."

The hunched up little figure stalked up to his greatgrandson and tapped him sternly on the knee. This had the effect of reminding Zaphod that he was talking to a ghost because he didn't feel a thing.

"You know and I know what being President means, young Zaphod. You know because you've been it, and I know because I'm dead and it gives one such a wonderfully uncluttered perspective. We have a saying up here. 'Life is wasted on the living.'"

"Yeah," said Zaphod bitterly, "very good. Very deep. Right now I need aphorisms like I need holes in my heads."

"Fifty seconds," grunted Ford Prefect.

"Where was I?" said Zaphod Beeblebrox the Fourth.

"Pontificating," said Zaphod Beeblebrox.

"Oh yes."

"Can this guy," muttered Ford quietly to Zaphod, "actually in fact help us?"

"Nobody else can," whispered Zaphod.

Ford nodded despondently.

"Zaphod!" the ghost was saying, "you became President of the Galaxy for a reason. Have you forgotten?"

"Could we go into this later?"

"Have you forgotten?" insisted the ghost.

"Yeah! Of course I forgot! I had to forget. They screen your brain when you get the job, you know. If they'd found my head full of tricky ideas I'd have been right out on the streets again with nothing but a fat pension, secretarial staff, a fleet of ships and a couple of slit throats."

"Ah," nodded the ghost in satisfaction, "then you do remember!"

He paused for a moment.

"Good," he said and the noise stopped.

"Forty-eight seconds," said Ford. He looked again at his watch and tapped it. He looked up.

"Hey, the noise has stopped," he said.

A mischievous twinkle gleamed in the ghost's hard little eyes.

"I've slowed down time for a moment," he said, "just for a moment you understand. I would hate you to miss all I have to say."

"No, you listen to me, you see-through old bat," said Zaphod leaping out of his chair, "A—Thanks for stopping time and all that, great, terrific, wonderful, but B—no thanks for the homily, right? I don't know what this great thing I'm meant to be doing is, and it looks to me as if I was supposed not to know. And I resent that, right?"

"The old me knew. The old me cared. Fine, so far so good. Except that the old me cared so much that he actually got inside his own brain—my own brain—and locked off the bits that knew and cared, because if I knew and cared I wouldn't be able to do it. I wouldn't be able to go and be President, and I wouldn't be able to steal this ship, which must be the important thing."

"But this former self of mine killed himself off, didn't he, by changing my brain? Okay, that was his choice. This new me has its own choices to make, and by a strange coincidence those choices involve not knowing and not caring about this big number, whatever it is. That's what he wanted, that's what he got."

"Except this old self of mine tried to leave himself in control, leaving orders for me in the bit of my brain he locked off. Well, I don't want to know, and I don't want to hear them. That's my choice. I'm not going to be anybody's puppet, particularly not my own."

Zaphod banged on the console in fury, oblivious of the dumbfounded looks he was attracting.

"The old me is dead!" he raved. "Killed himself! The dead shouldn't hang about trying to interfere with the living!"

"And yet you summon me up to help you out of a scrape," said the ghost.

"Ah," said Zaphod, sitting down again, "well that's different, isn't it?"

He grinned at Trillian weakly.

"Zaphod," rasped the apparition, "I think the only reason I waste my breath on you is that being dead I don't have any other use for it."

"Okay," said Zaphod, "why don't you tell me what the big secret is. Try me."

"Zaphod, you knew when you were President of the Galaxy, as did Yooden Vranx before you, that the President is nothing. A cipher. Somewhere in the shadows behind is another man, being, something, with ultimate power. That man, or being, or something, you must find—the man who controls this Galaxy, and—we suspect—others. Possibly the entire Universe."

"Why?"

"Why?" exclaimed an astonished ghost. "Why? Look around you, lad, does it look to you as if it's in very good hands?"

"It's all right."

The old ghost glowered at him.

"I will not argue with you. You will simply take this ship, this Improbability Drive ship, to where it is needed. You will do it. Don't think you can escape your purpose. The Improbability Field controls you, you are in its grip. What's this?"

He was standing tapping at one of the terminals of Eddie the Shipboard Computer. Zaphod told him.

"What's it doing?"

"It is trying," said Zaphod with wonderful restraint, "to make tea."

"Good," said his great-grandfather, "I approve of that. Now Zaphod," he said, turning and wagging a finger at him, "I don't know if you are really capable of succeeding in your job. I think you will not be able to avoid it. However, I am too long dead and too tired to care as much as I did. The principal reason I am helping you now is that I couldn't bear the thought of you and your modern friends slouching about up here. Understood?"

"Yeah, thanks a bundle."

"Oh, and Zaphod?"

"Er, yeah?"

"If you ever find you need help again, you know, if you're in trouble, need a hand out of a tight corner..."

"Yeah?"

"Please don't hesitate to get lost."

Within the space of one second, a bolt of light flashed from the wizened old ghost's hands to the computer, the ghost vanished, the bridge filled with billowing smoke and the *Heart of Gold* leaped an unknown distance through the dimensions of time and space. ■ ■ ■

Circle No. 30 on Reader Service Card

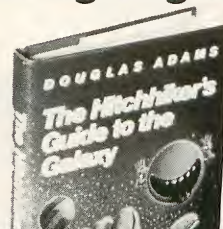
Douglas Adams'

best-selling

HITCHHIKER'S TRILOGY

is complete at last!

In the beginning was...

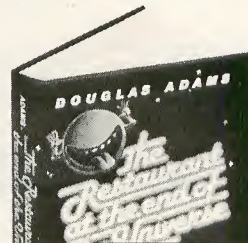


THE HITCHHIKER'S GUIDE TO THE GALAXY

"Inspired lunacy that leaves hardly a science fiction cliché alive."

—Washington Post. \$8.95

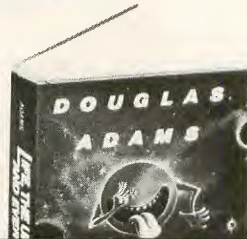
Then came...



THE RESTAURANT AT THE END OF THE UNIVERSE

"Creative insanity rivaling Alice's Adventures in Wonderland for sheer chutzpah."—Los Angeles Herald-Examiner. \$9.95

And now... the cosmic conclusion...



LIFE, THE UNIVERSE AND EVERYTHING

"This parody of every science fiction book ever written is *sui generis* in all senses of that phrase."

—N.Y. Times Book Review. \$9.95

Send check or money order to Crown Publishers, Inc., Dept. 640, One Park Ave., N.Y., N.Y. 10016. Please add \$1.00 postage and handling charge per book. N.Y. and N.J. residents, add sales tax.

In Canada, order separately through Collins Publishers, 100 Leslie Rd., Don Mills, Ont. M3B 2T5. Please add \$1.00 postage and handling charge per book.

H·A·R·M·O·N·Y B·O·O·K·S

Custom Color

If your message is worth repetitive display, key these in.

by Dennis Kitsz

32K
Extended
Color
Basic



Photo 1. The Video Display Scroller in action. Banners stay in place, but text continuously scrolls by and repeats.

TRY RUNNING THIS one-liner on your Extended Color Basic Color Computer: 10 POKE &HFFC7,0 : GOTO 10. Garbage on the screen? Now tap the Break key: Aha! Back to normal.

What you've just seen is an example of the Color Computer's built-in video power. By means of a simple POKE statement, you can create a video window that will let you look anywhere in memory. If you have used Extended Basic's high-resolution graphics, you know you can move from one window to another by using the PCLEAR and SCREEN commands. Yet, Basic provides only a limited repertoire of viewing choices. Many more are available by directly manipulating the computer's trio of smart chips—the 6809E central processing unit (CPU), the 6883 synchronous address multiplexer (SAM), and the 6847 video display generator (VDG).

This month's Custom Color presents the Video Display Scroller, a program I originally concocted for museum exhibits. It provides true rolling text (like television credits), together with optional top and bottom banners. Working with the

machine language display routine is a Basic text editor/display driver.

What It Is

The Video Display Scroller consists of three programs—one in Basic and two in 6809 assembly language—which you can use to enter and edit up to 350 lines of text and banners. You may then display the text and banners in a continuous, slowly rolling and repeating pattern, in true upper- and lowercase form. Banners are optional, displayed in twice-normal-size letters. Among the other features: the space between displayed lines may be varied for dense or loose text; normal or reverse lettering can be selected; text may be saved for later use and revision; and display fonts may be redefined by software. Once the program is running, it is break free, meaning it can be used in a public area without fear of disrupting the display from the keyboard. A finished display can look like those in Photo 1.

The Video Display Scroller system requires a 32K Extended Color Basic Color Computer; the programs are presented

in Listings 1–3. The Basic listing is easily typed in and saved on tape (use the name DRIVER). For the assembly listings, you will need Radio Shack's Editor/Assembler, EDTASM+ (available on a plug-in cartridge). Enter, check for errors (A/WE) and save (W SCROLL) the first source code, then assemble the code (A SCROLL/NL/NS) and save it to tape. Do each several times. Enter, check for errors and save (W BANNER) the second source code, and then assemble (A BANNER/NL/NS) that to tape. You will now have copies of the Basic Driver; the Scroll source code; the Scroll object code; the Banner source code; and the Banner object code.

In order to make the best use of the Video Display Scroller, I have set up a series of simple procedures for making sure you have properly arranged copies of the program. Using copies of the Basic Driver program and the Scroll and Banner object codes, follow these steps:

1. CLOAD the Basic program, remove the tape, and insert a fresh tape. CSAVE the program just once: CSAVE"DRIVER". Remove the tape.

2. Load the two scroller object codes one after the other (CLOAD M"SCROLL" and CLOADM"BANNER"). Remove the tape.

3. Replace the same tape used in step 1, set it to record, and enter:

CSAVEM"SCROLL", &H4800, &H4FFF, &H4812.

Repeat Steps 1 to 3 for several complete back-up copies of the system. Performing these steps takes some time, but subsequent uses of the program will be quick and simple.

4. Rewind the tape, turn the computer off and on, and set the tape to play.

5. Enter:PCLEAR8. This step is essential to avoid an error inherent to the organization of Extended Basic's graphics system.

6. Enter CLOAD. The program will load in a few seconds, and respond with an OK message.

7. RUN. The computer will automatically load the next available program—which should be the SCROLL machine language program set—and return with the Functions menu.

You are now ready to use the Video Display Scroller.

How It Works

Before jumping to use the Video Display Scroller, take a few minutes to understand its operation. The Basic Driver

program is very dense; it must operate in a 4.5K environment to leave lots of memory space for the high-resolution display (12,288 bytes), the text (display banners and about 350 32-character lines—12,288 more bytes), the machine language programs and character fonts (2,048 bytes). The regular video screen and Basic operating system use 1,536 bytes.

Because of this limited space, the Basic Driver is packed tight. When you type it in, observe every space and punctuation mark, including the missing final quotation marks in lines 19, 22, 26, 28, 34 and 44.

Line 1 clears the screen, sets available memory, sets the high-resolution pixel mode, loads the machine language driver, and assigns all variables. Lines 2 and 3 create the Function menu and distribute input. Functions are memory clearing (line 4), text entry (lines 5–11), text editing (lines 12–18), tape storage (lines 19–21), tape loading (lines 22–25), scroller display execution (lines 26–27), and system copy (lines 28–29). Text recovery is directed to lines 44–45. Special functions are entered and distributed from lines 30 and 31: normal/reverse lettering (lines 32–33), vertical line spacing (lines 34–35), upper/lower borders (lines 36–38), and banner creation (lines 39–43). Input and cosmetic display subroutines are in lines 47–99.

The heart of the Video Display scroller, however, is the machine-language display routine. Before turning to the program, I will detail the problem to be solved.

A normal computer screen scroll moves the body of text one full line of characters up the screen; that is, an entire new line of characters becomes visible at the bottom of the screen and the remaining text is bumped upwards. Contrast this all-or-nothing approach with that of TV or movie credits, which *roll* up the screen with parts of the letters appearing until the whole letter is visible. It is a smooth, professional looking process. Achieving the same goal on the typical computer screen is impossible; the memory locations displayed by the hardware and software are fixed at manufacture to require that a complete line of 32 characters be moved into place at one time.

With the Color Computer, however, the high-resolution graphics system can be employed to draw letters or parts of letters on the screen. Each character is made up of individual dots; the dots are created when a moving electron beam turns on brightly or dims as it passes horizontally across the screen. This is conven-

ient; although ordinary text display is created for hardware and software convenience during manufacture, it is still possible to draw any piece of a letter at any place on the screen.

From these hints, it is a short mental step to actually designing a repertoire of letters and symbols which can be placed on the bottom line of the screen, moving the screen contents up a single electron beam line, and drawing additional pieces of letters on the now-blank bottom line.

As it turned out, I wasn't done when I arrived at that point. In fact, I implemented the software I just described, but discovered something disconcerting. Because each letter had to be created from separate "pieces"—byte-sized pieces—a lot of memory was used to store a reference table of letters. *That* I could live with; but a full high-resolution screen of 512 characters actually used 6,144 bytes of letter pieces. I could live with that too—except that the software action which moved the information up the screen one electron beam line turned out to be visible. It wiggled down the screen! Not the professional touch I had envisioned.

Then I remembered the smart VDG. Leafing through the manual, I found I could effectively define the memory window to be displayed. Why not display one screen of letters while updating another, then switch to the updated screen? Updating would always occur on the screen not being displayed. That way each screen memory would move up two lines—alternating odd and even lines—for a very smooth rolling display.

That was the trick; now to the program itself (Listing 2). The housekeeping (setting the direct page register for program speed, and setting a pointer to the display text) is done in lines 250–300 of Listing 2.

Next, the SAM registers (those memory locations used to define where the VDG looks to display information) are prepared. The unusual thing about the SAM registers is this: it's not *what* you write to the SAM's memory registers, but *which* memory register you use that matters! Remember how to get your computer to run in high speed? You POKE 65495,X . . . and X can be anything. For normal speed, POKE 65494,X . . . again, X can be anything.

Lines 320–380 of Listing 2 select a memory block using this method: the most significant portions of the address of the upper left-most display point is given to the seven-bit binary value described by registers \$FFC6 through \$FFD3; the final bit is always a zero. Using the odd-numbered register loca-

tions defines a one for the SAM, and the even-numbered locations define a zero. The value derived by addressing \$FFC7, –C9, –CB, –CD, –CE, –D0, and –D2 is 0001111(0), or \$1E. \$1E00 becomes the starting address for one screen. Way down in lines 660 and 670, \$FFCA and \$FFCC are used, changing two bits of this addressing figure: it becomes binary 0000011(0), or \$06. \$0600 describes the start of the other screen.

Screen \$1E00 therefore is displayed by line 380. Screen \$0600 is being used. Lines 400–490 establish screen \$0600 and move up two lines of dots. Lines 510–640 put the new dots in place. The screens are switched in lines 660–670, displaying screen \$0600. Lines 690–780 work on the undisplayed screen \$1E00. Finally, lines 800–970 test for the end of the line, end of text, etc., to continue and complete the scrolling pattern. The motion subroutines follow in lines 1000–1460, and the ASCII dot pattern look-up table comprises the rest of the program.

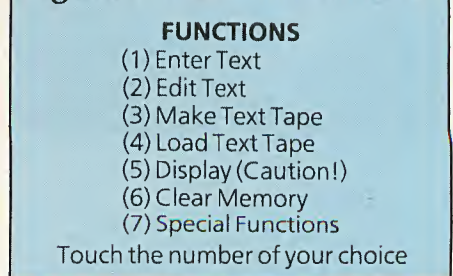
A similar process is followed for the Banner program (listing 3), except that double-width characters are produced using the unique double-edged shift-and-rotate routine in lines 940–1090.

Using the Video Display Scroller

First and most important: plan your input! The final scrolling display you are creating presents only a 32-character line, and its editor has limited word processing functions. Original text and screen (page) layout should be sketched and typed on paper as any display text would be. Only then should it be entered into the computer.

Remember to PCLEAR8 before loading and running the Video Display Scroller! After initially loading and running the program, the Functions menu will be presented (Fig. 1).

Figure 1. Functions Menu.



Since this is your first session, clear memory from line 0 (see Selection 6, below).

- To enter text a line at a time, choose Selection 1: Entering Text. Your memory
- Please turn to page 50*

Spectacular TRS-80®

TRS-80 16K Standard
Color Computer

**Save
\$100**

Reg. 299.95

199.95

Cat. No.
26-3004

Less TV and Program Pak



TRS-80 32K B
Color C

Save
Reg. 549.95
399.95
Less TV

A Smart Investment

Each of Radio Shack's popular TRS-80 Color Computers is now on sale. You can get a complete, versatile system for as low as \$199.95. It's the affordable way for the entire family to start computing! Or if you require a system for advanced applications—like high-resolution color graphics—choose one of our "professional" models for as low as \$299.95. It's a phenomenal price for a computer that provides so much fun, programming power and around-the-house usefulness.

Easy to Use

Plug in an instant-loading Program Pak™ cartridge and you can play exciting games, keep a personal budget, solve problems, analyze investments, write letters and themes, set up a household inventory, and much more. A TRS-80 Color Computer is great for learning at home, too—touch-typing, math review, reading skills. And you can express yourself with computer artistry and compose music.

Write Your Own Programs

Our easy-to-use Color BASIC is ideal for home or school applications. You can create graphics with up to eight colors, and incorporate music and sound effects into your programs, too. Our entertaining tutorial manual shows you how! You get a 32×16 screen format, data and string handling, dimensioned arrays, math functions, 9-digit accuracy and more. Save your own programs and data on cassettes with an optional recorder.

A Programmer's Dream

If you want to create high-resolution color graphics, then select a sale-priced TRS-80 Color Computer with Extended BASIC. Using one-line commands, you can easily produce incredible designs, engineering drawings, business charts, even animation. We include two tutorial manuals, our regular Color BASIC book and an advanced manual that shows you how to take full advantage of the programming power of Extended Color BASIC.

Color Computer Sale!

Circle No. 31 on Reader Service Card

TRS-80 16K Extended BASIC
Color Computer

**Save
\$100**

Reg. 399.95

299.95

Cat. No.
26-3002

Less TV



ended BASIC
mputer

**\$150
99.95**

Cat. No.
26-3003

Sophisticated

Extended BASIC offers the programmer a 256 x 192 screen resolution, string arrays up to 255 characters, editing, tracing, error messages, user-definable keys, PEEK, POKE and more.

Entertaining

Your TRS-80 Color Computer is more than just a programming workhorse. There's a library of fast-paced action games to choose from—old favorites like Polaris or Microbes and new entries like Poltergeist and Castle Guard. You can also challenge it to a game of chess—or let it help you brush up on your bridge.

Educational

The Color Computer Learning Lab will teach you BASIC programming while LOGO will open up the fascinating world of "turtle graphics" to the kids. Our Fun With Reading™ series will help them through such classics as *Moby Dick* and *The Hound of the Baskervilles*, too.

Expandable

You can add disk drives easily—just plug them into the Program Pak ROM-port. You can also add a printer, graphics tablet, digitizer, modem and other peripherals to meet future needs.

A Perfect Time to Buy

With these fantastically low prices, now is the time to stop by your neighborhood Radio Shack store, Computer Center or participating dealer. But hurry—sale ends 6/26/83.

Radio Shack®
The biggest name in little computers®
A DIVISION OF TANDY CORPORATION

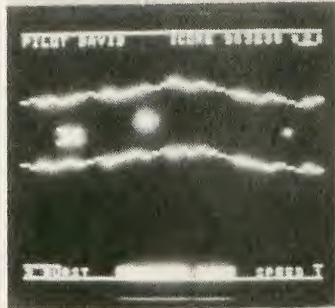
Retail prices may vary at individual stores and dealers. Poltergeist ©1982 Metro-Goldwyn-Mayer Film Co. and SLM Entertainment Ltd.

WORMTUBE™

by John Bobst

*An original all-machine-language game
for the TRS80 Color Computer:*

- *1 to 4 players (taking turns,
"in-progress" savable)
- *6 distinct sound effects
(7 if counting "foosh")
- *1 joystick and 16K either
BASIC required (average?)
- *8 colors on a black screen
(Semigraphics 12)
- *1 "pause" key, 1 exit key, and
1 reset key (handy)
- *255,999,999 points possible
(not @#%&! likely)
- *9 speeds/skill-levels
(changeable during play)
- *4 copies on 1 cassette
(disk savable/loadable)
- *1 source only
(at a "factory direct price")



A great description for \$29.95, but **WORMTUBE** is a great game for only

\$17.95 + 2.50 S&H

(\$20.45) to:

ZETA SOFTWARE

P.O. Box 3522

Greenville, S.C. 29608

FREE catalog with order or write or call. No COD's, PO's or charge cards, please. TRS80™ TANDY Corp. **WORMTUBE**™ ZETA Computer — Phone: (803) 246-1741 — 1-9 p.m. EST.

Continued from page 47

area can hold up to 350 lines of text, enough for more than 1500 words. Simply type your text; the current line number is displayed at the top of the screen. End each line with a carriage return (ENTER). Any lines which are exactly 32 characters long will be automatically terminated by the editor, so be sure not to overtype a line. Backspacing corrects errors in the working line. If you do overtype a line, or press the Enter key before correcting an error, continue working; return to the line later using the edit mode (Selection 2).

To exit text entry mode and return to the Functions menu, press the right arrow key. You may re-enter this mode from where you left off; simply choose Selection 1.

• To edit text you have entered, choose Selection 2: Editing Text. Text is displayed for editing in groups of 12 lines, from the beginning of the text. The lines can be paged through, one at a time, by pressing C (continue). The lines are pulled from the video buffer to give a fairly precise picture of the final video display arrangement.

To edit a line, press E (edit). Enter the line number (the working numbers are shown at the top of the screen). The line will be displayed, followed by a prompt for you to type a new line. The new line may be of any length (including a blank line) 32 characters or less.

After a line has been edited and entered, the 12 lines will be displayed showing the edited line in its correct place. You may leave this mode and return to the Functions menu by pressing Q (quit).

• To preserve any text you have created, choose Selection 3: Making a Text Tape. Texts may be stored on cassette and recalled at any time for re-editing or for use by the scrolling display program. A unique name of up to eight letters (all capitals, please) may be assigned. Insert a tape into the player, set it to Record mode, and follow the screen prompts for this selection. The following information will be saved: the text, the last line number, and the banners. Information on banners is provided later, under Selection 7. *Note*—Do not use the following names, which are reserved for program use: BN, PV, SCROLL, DRIVER, TEXT and X.

• To recall text you have saved, choose Selection 4: Loading a Text Tape. Any stored text may be re-loaded for editing or display. If you know the file



NEW

FILE CABINET A SERIOUS UTILITY MULTIPURPOSE INFORMATION MANAGEMENT

Maintain any file you create; inventory, investments, mailing lists, budgets, recipes, etc.

Alphabetizes

Sorts Numeric Entries

Searches for key words or numbers

Computes totals & averages by categories

Saves Records, changes or deletes them, up to 20 entries for each record, up to 256 characters for each entry.

preformatted mailing list & recipe program included

Output to Screen, Printer or Tape.

PRINT all or selected records.

+,-,X,÷ Numeric Entries.

Owners Manual included with sample files

16K, 32K, Memory Expandable.

Extended Basic Required

Moreton Bay



Software

\$29.95 postage paid
CA Residents Add 6% Sales Tax

**MORETON BAY
SOFTWARE**

A DIVISION OF MORETON BAY LABORATORY
316 Castillo Street
Santa Barbara, CA 93101
(805) 962-3127

name, you may enter it in response to the prompts; the proper file will be searched for and loaded into the machine. If you do not know the name, just press the Enter key; the program will load the next available text file.

The next text file will be added to whatever text you have already entered, and your text entry point will be moved to the next available free line. Banners are automatically overwritten by the loaded file.

- To view the final results of your work, choose Selection 5: Displaying a File. Your banners and scrolling text may be displayed using Selection 5. Touch D for a display, or X to return the Functions menu.

A warning: Use this mode only when a text file has been entered, edited, and saved on tape. Once display has begun, the machine must be reset (by pressing the switch on the back right). You can recover the editor intact by typing:

GOTO2 ENTER

This will return you to the Functions menu.

- To free memory for text entry, choose Selection 6: Clearing Memory. When the computer is first turned on, text memory is filled with random, unwanted characters. To prevent those characters from appearing in your text, you should clear memory. In response to the question "Clear from which line?", enter 0 (zero). It will take approximately three minutes to complete this initialization process.

There are other times you may wish to use Selection 6, such as if you want to load additional text but need to leave a standard opening intact (such as "Schedule of Events. These events are subject to change...", etc.). To do this, you may clear memory from a specific line; your text entry point will then be moved to the first available free line.

If you accidentally enter the wrong line number (say, 12 instead of 120), immediately press the Break key. Type: GOTO2 ENTER and the Functions menu will be returned. You may have to re-type a few lines (using Selection 2), but your text will be saved.

- To create banners, set borders and line spacing, and reverse letters, choose Selection 7: Special Functions. Details of the Special Functions menu and instructions are presented later.

Following are what I call system functions. Use these with care; they are not displayed on the menu.

Please turn the page



Circle No. 38 on Reader Service Card

EPSON PRINTERS FOR YOUR COCO!

EPSON		
MX-80	- PARALLEL	\$399.95
MX-80 FT	- PARALLEL	\$529.95
MX-100	- PARALLEL	\$699.95
NEW FX-80	- PARALLEL	\$569.95
SERIAL INTERFACE		
WITH 4K BUFFER		\$99.95

UNIVERSAL SERIAL INTERFACE

ALL PARALLEL PRINTERS	-	\$99.95
SPECIAL WITH ANY PRINTER		\$79.95

PRO WRITER

8510 P	\$469.95	8510 S	\$569.95
--------	----------	--------	----------

TDP COMPUTERS

16K BASIC	\$324.95	16K EXT. BASIC	
DRIVE 0	\$459.95	\$419.95	
		MODEM 1	\$139.95

LINE PRINTER 1 \$349.95

TERMS: BANK OR CERTIFIED CHECK, VISA, MC, C.O.D.
PERSONAL CHECKS TAKE 2 WEEKS TO CLEAR.
CONNECTICUT ORDERS ADD 7-1/2% SALES TAX.

"80" PLUS MICROCOMPUTERS

74 NEW HAVEN RD SEYMOUR, CT 06483
203/888-0170

Disk Drives for your Co Co at Great Prices!

Tandon Starter Kit Includes one Tandon drive, a case and power supply, a Radio Shack controller, two drive cable, the Radio Shack disk manual. Was \$444 — now only \$375
(If you wish, the Radio Shack (TEC) drive can be substituted for the Tandon.)

— *NEW* — *Dual Head Drive 0*. Includes one dual head Tandon drive instead of the single head above. This system does not require FLEX. The computer treats each side as a separate drive, making your computer compatible with any DOS. Double your storage capacity.

Was \$529 — now only \$459

Tandon Drive one \$229

(\$15 off if bought with above) (Includes case and P/S)

Radio Shack controller \$249
(includes cable and manual)

SUPPLIES

10 Wabash disks ss/dd \$23

MEMORY

8 16K chips. Originally \$29.50 — now only \$19.95

8 64K chips. Originally \$75.00 — now only \$65.00

PRINTERS

Star Gemini 10 Printer Includes 2K buffer, Friction and tractor feed, 9 Wire print head, Italics, underline, super and subscripts and dot by dot graphics \$399

Botek Printer Interface . . \$65 (\$10 off if purchased with any printer)

Radio Shack and
TRSDOS are
registered
trademarks of the
Tandy
Corp.

S and N Enterprises

8 Wilson Court
Spring Valley, NY 10977
(914) 362-0713/354-5510

All prices subject
to change without
notice
NY state residents
please add
sales tax

Circle No. 39 on Reader Service Card

Color Computer/51

NEW for the Color Computer TRS-80*
'COCOCASSETTE' SUBSCRIPTION SOFTWARE
 *TRS 80 IS A TRADEMARK OF TANDY COMPANY



ENJOY A MONTHLY COLLECTION OF 8-10 PROGRAMS!

Including games, education, home finance and more; on cassette for as low as \$5.00 a month! Add some action and imagination to your Color Computer...Best of all, we do the work!

PRICES	
1 YR (12 ISSUES)	\$55.00
6 MO (6 ISSUES)	\$30.00
SINGLE COPIES	\$ 6.00

— MICHIGAN RESIDENTS ADD 4% TO ORDER
 — OVERSEAS ADD \$10.00 TO SUBSCRIPTION AND \$1.00 TO SINGLE COPIES



SUBSCRIPTION SOFTWARE



SEND CHECK OR MONEY ORDER TO:

T & D SOFTWARE

P.O. BOX 256-C • HOLLAND, MICH. 49423

616 396-7577

PROGRAMS ARE FOR
 EXTENDED BASIC MODEL ONLY
 ISSUES ARE SENT FIRST CLASS



Program Listing 1

Listing 1. Type the Basic driver for Video Display Scroller precisely as shown to fit and run in the 4.5K memory environment.

```

1 CLS: CLEAR Q0, &H4B00: PMODE4, 1: PCLS: PMODE4, 5: PCLS: CLOADM "SCROLL":
B$=CHR$(8): E=256: F=32: G=&H5000: H=G+F: C$=CHR$(34): D$=CHR$(13): X$=
"X": L=1: S=2: U=0: W=0: B1=&H7F00: B2=&H7F40: T=&H4B12: Z=16
2 Z$="FUNCTIONS": GOSUB50: PRINT "(1) Enter Text": PRINT "(2) Edit Te
xt": PRINT "(3) Make Text Tape": PRINT "(4) Load Text Tape": PRINT "(5
) Display (Caution)": PRINT "(6) Clear Memory": PRINT "(7) Special
Functions": GOSUB54: POKE282, 255
3 GOSUB49: ONVAL (A$)+1: GOTD3, 5, 12, 19, 22, 26, 4, 30, 44, 28
4 A=G-1: Z$="MEMORY CLEARING": GOSUB50: INPUT "Clear from which line
": Q: IF Q: 383 THEN 4 ELSE PRINT "Please wait...": PRINT @E, "Clearing: "; F
ORX=G+(D*F) TO &H7FFF: PRINT @265, X-A: POKE X, F: NEXT: PRINT: PRINT "Read
y": GOSUB51: L=0: GOTD2
5 CLS: P=0: PRINT: GOSUB47: GOSUB55: PRINT L: Q=F*L+H: GOSUB47
6 PRINT @P+E, " ": A$=INKEY$: IF A$=" " THEN ELSE
7 PRINT @P+E, CHR$(140): A$=INKEY$: IF A$=" " THEN ELSE
8 IF A$=B THEN 9 ELSE IF A$=D THEN 11 ELSE IF A$=CHR$(9) THEN CLS: GOTD2 ELSE
PRINT @P+E, A$: P=P+1: POKE Q, ASC(A$): Q=Q+1: IF P=F THEN 11 ELSE
9 PRINT @P+E, " ": POKE Q, F: P=P-1: IF P=0 THEN P=Q ELSE Q=Q-1
10 PRINT @P+E, " ": GOTD6
11 L=L+1: GOSUB48: GOTD5
12 R=H
13 CLS: GOSUB55: PRINT (R-H)/F+1 "to" (R-H)/F+12: GOSUB47: FORX=0 TO 383:
PRINT CHR$(142) CHR$(141) B$B$CHR$(PEEK(R+X)): NEXT: PRINT @44B, " ": G
OSUB47: PRINT "C"ontinue, "E"dit, "D"uit":
14 GOSUB49: IF A$="C" OR A$="c" THEN 11 ELSE IF A$="E" OR A$="e" THEN 11 ELSE I
F A$="D" OR A$="d" THEN 2 ELSE 14
15 R=R+384: GOTD13
16 PRINT @4B0, STRING$(31, F): PRINT @4B0, "Edit which line": INPUT
17 Z$="LINE EDITING": GOSUB50: PRINT: GOSUB55: PRINT Y: GOSUB47: FORX=0
TO 31: PRINT CHR$(142) CHR$(141) B$B$CHR$(PEEK(G+X+(Y*F))): NEXT: PRIN
T: PRINT "Enter new line": LINE INPUT Y$: IF LEN(Y$) F THEN GOSUB52: GOT
D17
18 M=LEN(Y$): Y$=Y$+STRING$(F-M, F): FORX=0 TO 31: POKE G+X+(Y*F), ASC(M
ID$(Y$, X+1, 1)): NEXT: GOTD13
19 Z$="TEXT STORAGE": GOSUB50: PRINT "Insert cassette. Place recor
der": PRINT "in RECORD position.": PRINT: PRINT "Press ENTER when re
ady.
20 GOSUB49: IF A$=D THEN 21 ELSE IF A$=X THEN 2 ELSE 20
21 PRINT @E+F, "Enter the NAME of the text file": PRINT "no more th
an 8 letters": PRINT: INPUT N$: IF LEN(N$) > 8 THEN CLS: GOTD2 ELSE PRINT
: PRINT "Now saving "N$: CSAVEN "BN", B1, B2+64, T: GOTD2
22 V=0: Z$="TEXT TAPE LOADING": GOSUB50: PRINT "IMPORTANT": PRINT: PR
INT "To cancel this function, press": PRINT C$X$C$ now ....
23 A$=INKEY$: IF A$="" THEN V=V+1 ELSE 2
24 IF V=0 THEN 23
25 N$="": PRINT: PRINT "Enter text file name (if known).": PRINT "Pr
ess ENTER to begin.": INPUT N$: PRINT: PRINT "Loading "N$: CLOADM N$, L
*F+F: OPEN "I", #1, "PV": INPUT #1, I: CLOSE #1: L=L+I: CLOADM "BN": GOSUB
48: GOTD2
26 Z$="SCROLLING DISPLAY": GOSUB50: PRINT "Press "C$X$C$ to exit t
his function.": PRINT "Press "C$D$C$ for Display.
27 GOSUB49: IF A$=X THEN 2 ELSE IF A$=D THEN 2 THEN SCREEN1, 1: EXEC ELSE 27
28 Z$="System Copy": GOSUB50: PRINT: PRINT "Set tape to record & pre
ss ENTER
29 GOSUB49: IF A$="" THEN 29 ELSE IF A$=J THEN 30: CSAVE "DRIVER": GOSUB51: CSA
VEN "SCROLL", T-18, G, T: GOSUB51: CSAVE "TEXT", G, &H7FFF, T: GOSUB51: NEX
T: GOTD2
30 Z$="SPECIAL FUNCTIONS": GOSUB50: PRINT "(1) Normal, black-on-whi
te": PRINT "(2) Reverse, white-on-black": PRINT "(3) Set Vertical Li
ne Spacing": PRINT "(4) Set Upper Border": PRINT "(5) Set Lower Bord
er": PRINT "(6) Create Banners": PRINT "(7) Quit": GOSUB54
31 GOSUB49: ONVAL (A$)+1: GOTD3, 32, 33, 34, 36, 37, 39, 2, 31, 99
32 POKE &H4B1, 67: GOTD30
33 POKE &H4B1, 18: GOTD30
34 Z$="VERTICAL SPACING": GOSUB50: PRINT "1 to 6 white lines.": PRIN
T "Overlap may be obtained with the": PRINT "range -8 to 0.": PRINT
: PRINT "Current line spacing is "S: B$.
35 INPUT "Enter new line spacing": S: IF S<(-8 OR S)>6 THEN 34 ELSE S=S:
POKE &H4B4, S+9: POKE &H4B7F, S+9: GOTD30
36 Z$="UPPER BORDER": GOSUB53: PRINT "upper border is "U: B$.": INPUT
"Enter new upper border": U: IF U<0 OR U>12 THEN 36 ELSE U=U: POKE &H4B
32, 6+U: POKE &H4B68, 30+U: GOTD38
37 Z$="LOWER BORDER": GOSUB53: PRINT "lower border is "W: B$.": INPUT
"Enter new lower border": W: IF W<0 OR W>12 THEN 37 ELSE W=W: POKE &H4B
36, 29-W: POKE &H4B6C, 53-W
38 POKE &H4B10, PEEK(&H4B36)-PEEK(&H4B32)+1: GOTD30
39 V=&H4F00: Z$="BANNERS": GOSUB50: PRINT "Banners are 16 letters pe
r line.": D=1: PRINT: PRINT "(1) Upper or (2) Lower Banner?": GOSUB5
4: GOSUB49: IF A$="1" THEN 42 ELSE IF A$="2" THEN 43 ELSE 39
40 PRINT @352, STRING$(Z, MID$(STR$(D), 2, 1)): PRINT @320, "Enter line
": D: B$="": LINE INPUT Q$: N=LEN(D$): IF N Z THEN GOSUB52: GOTD40
41 Q$=Q$+STRING$(Z-N, F): FORX=0 TO 15: POKE B+X+(D-1)*Z, ASC(MID$(Q$, X
+1, 1)): NEXT: D=D+1: IF D=5 THEN EXEC &H4F12: GOTD30 ELSE 40
42 B=B1: POKE V+45, 0: POKE V, 6: POKE V+2, 30: POKE V+5, 64: GOTD40
43 B=B2: POKE V+45, 64: POKE V, 18: POKE V+2, 42: POKE V+5, 128: GOTD40
44 Z$="TEXT RECOVERY FUNCTION": GOSUB50: PRINT "After a terminal er
ror, forcing": PRINT "RUN or CLOAD, text may be": PRINT "recovered i
f end line is known.": PRINT: PRINT "Use the Edit function to page"
: PRINT "through text to find that line.
45 INPUT "Enter final line number": L: GOSUB48: GOTD2
46 END
47 PRINT STRING$(F, 131): RETURN
48 POKE &H4B04, FIX (L/B)+B1: RETURN
49 A$=INKEY$: IF A$=" " THEN 49 ELSE RETURN
50 CLS: PRINT: GOSUB47: C=(F-LEN(Z$))/2-1: PRINT TAB(C) Z$: GOSUB47: PR
INT: RETURN
51 FORN=1 TO E: NEXT: RETURN
52 PRINT: PRINT "The line is too long.": GOSUB51: RETURN
53 GOSUB50: PRINT "Border range is 0 to 12 (each): PRINT "half of th
e screen divided into": PRINT "twelfths.": PRINT: PRINT "Current ": R
ETURN
54 PRINT: PRINT "Touch the number of your choice": RETURN
55 PRINT "Line Number": RETURN
59 CSAVE X$, &H600, &H7FFF, &H4B12: GOTD2

```

**PREMIUM SOFTWARE
 FOR THE COLOR COMPUTER**

SISI (16K EXT. BASIC) \$9.95
 Sisi the fortune telling computer uses data that you input to determine a character reading for you.

COLORHYTHM (16K EXT. BASIC) \$9.95
 Plots your biorhythm in hi-res graphics for 15 days.

PRESCHOOL PAK (16K EXT. BASIC) \$8.95
 Two preschooler learning drills. Contains ALPHABET & COUNTER. Makes use of hi-res graphics and sound. The kids think it's a game!

MONEY MINDER II (16K) \$14.95
 A cassette based personal finance program. Up to 56 user definable budget categories. Printout capability. Menu driven—easy to use.

DISK MONEY MINDER (32K plus disk) \$19.95
 Similar to MONEY MINDER II but for use with disk. Easier and faster to use.

HARMONYCS

P.O. BOX 1573
 SALT LAKE CITY, UTAH 84110

Continued from page 51

● To recover from certain errors, choose Selection 8: Restoring the Line Number. You may occasionally cause an error, delete the program, or otherwise lose the parameters of the running Video Display Scroller program. However, unless you have turned the machine off, chances are your text is still intact. (If you have deleted this program, reload it.) If Selection 1 (Entry Mode) displays line 1, exit this mode (right arrow), and choose Selection 2 (Edit Mode). Using the C key, page through the text until you identify the number of the place your text should end. Exit edit mode by pressing Q. When the Functions menu reappears, press 8.

In response to the query "Enter final line number," enter the number you have determined to be the last line of your text. Everything will be recovered.

Program Listing 2

Listing 2. Scroll routine is quite short (only 232 bytes), but the 1,536-byte character font is extensive.

4800		00100	ORG	\$4800
		00110 *		
	48	00120	SETDP	\$48
		00130 *		
4800	0000	00140	DOTROW	FDB \$0000
4802	5000	00150	TXTTBL	FDB \$5000
4804	8000	00160	MAXTXT	FDB \$8000
4806	0000	00170	DISPLY	FDB \$0000
4808	1DE0	00180	LOWROW	FDB \$1DE0
480A	0000	00190	STORED	FDB \$0000
480C	0000	00200	STOREX	FDB \$0000
480E	0000	00210	HIREX	FDB \$0000
4810	1000	00220	SCREEN	FDB \$1000
	0040	00230	OFFST2	EDU \$40
		00240 *		
4812	86	00250	XXXXXX	LDA \$86
4814	1F	00260	TFR	A, DP
		00270 *		
4816	9E	00280	WHERE	LDX \$9E
4818	C6	00290		LDB \$C6
481A	D7	00300	STB	(DOTROW+1
		00310 *		
481C	B7	00320	BACK	STA \$B7
481F	B7	00330		STA \$B7
4822	B7	00340		STA \$B7
4825	B7	00350		STA \$B7
4828	B7	00360		STA \$B7
482B	B7	00370		STA \$B7
482E	B7	00380		STA \$B7
		00390 *		
4831	C6	00400		LDB \$C6
4833	D7	00410		STB (HIREX
4835	C6	00420		LDB \$C6
4837	D7	00430		STB (LOWROW
4839	C6	00440		LDB \$C6
483B	D7	00450		STB (LOWROW+1
483D	9F	00460		STX (STOREX
483F	17	00470		LBSR TROUP
4842	9E	00480		LDX (STOREX
4844	8D	00490		BSR AGAIN
		00500 *		
4846	D6	00510		LDB (DOTROW+1
4848	5C	00520		INCB
4849	C1	00530		CMPE
484B	27	00540		BEQ JUMP1
484D	D7	00550		STB (DOTROW+1
484F	17	00560		LBSR TRNSFR
4852	20	00570		BRA JUMP2
4854	C6	00580		LDB \$C6
4856	D7	00590		STB (DOTROW+1
		00600 *		
4858	C6	00610		LDB \$C6
485A	D7	00620		STB (LOWROW+1
485C	8D	00630		BSR AGAIN
485E	17	00640		LBSR TRNSFR
		00650 *		
4861	B7	00660		STA \$B7
4864	B7	00670		STA \$B7
		00680 *		
4867	C6	00690		LDB \$C6
4869	D7	00700		STB (HIREX
486B	C6	00710		LDB \$C6
486D	D7	00720		STB (LOWROW
486F	C6	00730		LDB \$C6
4871	D7	00740		STB (LOWROW+1
4873	9F	00750		STX (STOREX
4875	8D	00760		BSR TROUP
4877	9E	00770		LDX (STOREX
4879	8D	00780		BSR AGAIN
		00790 *		
487B	D6	00800		LDB (DOTROW+1
487D	C1	00810		INCB
487E	5C	00820		CMPE
4880	27	00830		BEQ JUMP3

4882	D7	01	00840	STB	(DOTROW+1
4884	8D	5B	00850	BSR	TRNSFR
4886	20	04	00860	BRA	JUMP4
4888	C6	00	00870	LDB	\$500
488A	D7	01	00880	STB	(DOTROW+1
488C	9C	04	00890	CMPE	MAXTXT
488E	27	86	00900	BEQ	WHERE
			00910 *		
4890	D6	00	00920	LDB	\$500
4892	D7	03	00930	STB	(LOWROW+1
4894	8D	04	00940	BSR	AGAIN
4896	8D	43	00950	BSR	TRNSFR
			00960 *		
4898	0E	1C	00970	JMP	BACK
			00980 *		
			00990 *		
489A	E6	80	01000	AGAIN	LDB , X+
489C	C0	20	01010	SUBB	\$520
489E	86	00	01020	LDA	\$500
48A0	58		01030	ASLB	
48A1	49		01040	ROLA	
48A2	58		01050	ASLB	
48A3	49		01060	ROLA	
48A4	58		01070	ASLB	
48A5	49		01080	ROLA	
48A6	58		01090	ASLB	
48A7	49		01100	ROLA	
48A8	D3	00	01110	ADDD	(DOTROW
48AA	C3	48E9	01120	ADDD	#ASCII
48AD	1F	02	01130	TFR	D, Y
48AF	A6	A4	01140	LDA	, Y
48B1	43		01150	COMA	
48B2	D6	06	01160	LDB	DISPLY
48B4	109E	08	01170	LDB	LOWROW
48B7	A7	08	01180	STA	B, Y
48B9	5C		01190	INCB	
48BA	D7	06	01200	STB	DISPLY
48BC	C1	20	01210	CMPE	\$520
48BE	26	DA	01220	BNE	AGAIN
48C0	C6	00	01230	LDB	\$500
48C2	D7	06	01240	STB	DISPLY
48C4	39		01250	RTS	
			01260 *		
			01270 *		
48C5	9E	0E	01280	TROUP	LDB HIRES
48C7	DC	0E	01290	LDB	
48C9	C3	0040	01300	ADDD	#OFFST2
48CC	1F	02	01310	TFR	D, Y
48CE	DC	10	01320	LDD	SCREEN
48D0	83	0040	01330	SUBD	#OFFST2
48D3	D0	0A	01340	LOOPB	STD (STORED
48D5	E6	A0	01350	LDB	, Y+
48D7	E7	80	01360	STB	, X+
48D9	DC	0A	01370	LDD	(STORED
48DB	B3	0001	01380	SUBD	#51
48DE	26	F3	01390	BNE	LOOPB
48E0	39		01400	RTS	
			01410 *		
			01420 *		
48E1	1F	10	01430	TRNSFR	TFR X, D
48E3	63	0020	01440	SUBD	\$520
48E6	1F	01	01450	TFR	D, X
48E8	39		01460	RTS	
			01470 *		
			01480 *		
48E9	0000		01490	ASCII	EDU *
48EB	0000		01500	SPACE	FDB \$0000
48ED	0000		01510	FDB	\$0000
48EF	0000		01520	FDB	\$0000
48F1	0000		01530	FDB	\$0000
48F3	0000		01540	FDB	\$0000
48F5	0000		01550	FDB	\$0000
48F7	0000		01560	FDB	\$0000
48F9	1010		01570	FDB	\$0000
48FB	1010		01580	EXCLAM	FDB \$1010
48FD	1000		01590	FDB	\$1010
48FF	1000		01600	FDB	\$1000
4901	0000		01610	FDB	\$0000
4903	0000		01620	FDB	\$0000
4905	0000		01630	FDB	\$0000
4907	0000		01640	FDB	\$0000
4909	0000		01650	FDB	\$0000
490B	2828		01660	QUOTE	FDB \$2828
490D	2800		01670	FDB	\$2800
490F	0000		01680	FDB	\$0000
4911	0000		01690	FDB	\$0000
4913	0000		01700	FDB	\$0000
4915	0000		01710	FDB	\$0000
4917	0000		01720	FDB	\$0000
4919	2828		01730	FDB	\$0000
491B	FE28		01740	POUND	FDB \$FE28
491D	FE28		01750	FDB	\$FE28
491F	2800		01760	FDB	\$2800
4921	0000		01770	FDB	\$0000
4923	0000		01780	FDB	\$0000
4925	0000		01790	FDB	\$0000
4927	0000		01800	FDB	\$0000
4929	107E		01810	FDB	\$0000
492B	907C		01820	DOLLAR	FDB \$107E
492D	12FC		01830	FDB	\$907C
492F	1000		01840	FDB	\$12FC
4931	0000		01850	FDB	\$1000
4933	0000		01860	FDB	\$0000
4935	0000		01870	FDB	\$0000
4937	0000		01880	FDB	\$0000
4939	42A4		01890	FDB	\$0000
493B	4810		01900	PERCENT	FDB \$42A4
493D	244A		01910	FDB	\$4810
493F	8400		01920	FDB	\$244A
4941	0000		01930	FDB	\$8400
4943	0000		01940	FDB	\$0000
4945	0000		01950	FDB	\$0000
4947	0000		01960	FDB	\$0000
4949	3048		01970	FDB	\$0000
494B	3012		01980	AMPER	FDB \$3048
494D	2C4C		01990	FDB	\$3012
494F	7200		02000	FDB	\$2C4C
4951	0000		02010	FDB	\$7200
4953	0000		02020	FDB	\$0000
4955	0000		02030	FDB	\$0000
4957	0000		02040	FDB	\$0000
4959	1010		02050	FDB	\$0000
495B	1000		02060	SNGDUO	FDB \$1010
			02070	FDB	\$1000

Please turn the page

Circle No. 32 on Reader Service Card

Color Computer Programs From Star-Kits

SPELL 'N FIX — Essential for serious word processing! Finds and fixes spelling and typing mistakes fast. 20,000+ word dictionary can be expanded. Truly professional program. \$69.29 for RS disk or cassette, \$89.29 for Flex.

HUMBUG — The Ultimate Monitor has 37 commands to enter, examine, start, stop, even single-step machine language programs, and more. \$39.95 on disk or cassette for 16K or 32K systems, \$49.95 for 64K systems.

CHECK 'N TAX — Set of programs to balance checkbook and keep tax data on disk. \$50.

REMOVERSE — Allows using a terminal to give the Color Computer a full 24x80 display for serious users or remote operation. \$19.95.

LFPRINT — Permits use of a non-standard printer. \$19.95.

NEWTALK — Voice output program to examine and check memory. \$20.

SHRINK — Our fast version of Eliza. \$15.

OXOX — Our fast version of Othello. \$15.

CHECK 'N TAX requires 32K, all others 16K. We accept cash, check, COD, Visa or MC. NY State residents please include sales tax.

Star-Kits

P.O. Box 209—C
Mt. Kisco, N.Y. 10549
(914) 241-0287

432

HOMEBASE™ THE COMPLETE TRS-80* COLOR COMPUTER DATABASE IN ONE COMPLETE PACKAGE: TEXT PROCESSING • DATA MANAGEMENT SPREADSHEET CALCULATION TEXT & DATA UTILITIES

POWER & FLEXIBILITY:

- PAGE NUMBERING & HEADINGS
- RENAME files & PRINT DISK DIRECTORIES
- VARIABLE LENGTH alpha/text data fields
- DEFINE and TOTAL on fields within TEXT records
- Print FORM LETTERS & MULTIPLE COPIES
- FREE FORM REPORT WRITER for DATA files
- 50 DATA FIELDS per data record
- REORGANIZE data or text records
- SEARCH on record names or any data
- PRINT labels using text or data records
- ASSIGN your own record & data names
- FORMATTED printing for data records & fields
- MERGE, BACKUP (to cassette), or COPY any file
- 250 Screens of text with embedded printer controls
- ASCENDING & DESCENDING SORT using any data
- ADD, SUBTRACT, MULTIPLY or DIVIDE DATA FIELDS

EASY TO USE AND WELL SUPPORTED:

- NO programming or equipment modifications required
- MENU driven with single stroke commands
- COMPLETE cursor control for text & data entry
- 120 PAGE MANUAL WITH 2 MASTER DISKETTS
- REQUIRES: 32K Color Computer with 1 disk drive

FOR VISA/MASTER CARD ORDERS CALL:
800-334-0854 ext. 887
in N.C. 919-544-5408 OR SEND \$75.00
check/money order



HOMEBASE™ COMPUTER SYSTEMS
P.O. BOX 3448, DURHAM, N.C. 27702
N.C. residents add 4% sales tax.
HOMEBASE™ is a trademark of HOMEBASE™
COMPUTER SYSTEMS, a subsidiary of Small Business
Systems, Durham, N.C. (919) 544-5408.
*TRS-80 is a trademark of Tandy Corp.

Circle No. 33 on Reader Service Card

Color Computer/53

Continued from page 53

495D	0000	02000	FDB	\$0000	4A55	0000	03330	FDB	\$0000	4B51	0000	04600	FDB	\$0000		
495F	0000	02090	FDB	\$0000	4A57	0000	03340	FDB	\$0000	4B53	0000	04610	FDB	\$0000		
4961	0000	02000	FDB	\$0000	4A59	7C0A	03350	SEVEN	FDB	\$7C0A	4B55	0000	04620	FDB	\$0000	
4963	0000	02110	FDB	\$0000	4A5B	0810	03360		FDB	\$0810	4B57	0000	04630	FDB	\$0000	
4965	0000	02120	FDB	\$0000	4A5D	20A0	03370		FDB	\$20A0	4B59	3C42	04640	CAPG	FDB	\$3C42
4967	0000	02130	FDB	\$0000	4A5F	0000	03380		FDB	\$0000	4B5B	0000	04650	FDB	\$0000	
4969	0010	02140	LPAREN	FDB	\$0810	4A61	0000	03390	FDB	\$0000	4B5D	42A2	04660	FDB	\$42A2	
496B	2020	02150	FDB	\$2020	4A63	0000	03400		FDB	\$0000	4B5F	3C00	04670	FDB	\$3C00	
496D	2010	02160	FDB	\$2010	4A65	0000	03410		FDB	\$0000	4B61	0000	04680	FDB	\$0000	
496F	0000	02170	FDB	\$0000	4A67	0000	03420		FDB	\$0000	4B63	0000	04690	FDB	\$0000	
4971	0000	02180	FDB	\$0000	4A69	3844	03430	EIGHT	FDB	\$3844	4B65	0000	04700	FDB	\$0000	
4973	0000	02190	FDB	\$0000	4A6B	443B	03440		FDB	\$443B	4B67	0000	04710	FDB	\$0000	
4975	0000	02200	FDB	\$0000	4A6D	4444	03450		FDB	\$4444	4B69	42A2	04720	CAPH	FDB	\$42A2
4977	0000	02210	FDB	\$0000	4A6F	3800	03460		FDB	\$3800	4B6B	427E	04730	FDB	\$427E	
4979	2010	02220	RPAREN	FDB	\$2010	4A71	0000	03470	FDB	\$0000	4B6D	42A2	04740	FDB	\$42A2	
497B	0000	02230	FDB	\$0000	4A73	0000	03480		FDB	\$0000	4B6F	4200	04750	FDB	\$4200	
497D	0010	02240	FDB	\$0810	4A75	0000	03490		FDB	\$0000	4B71	0000	04760	FDB	\$0000	
497F	2000	02250	FDB	\$2000	4A77	0000	03500		FDB	\$0000	4B73	0000	04770	FDB	\$0000	
4981	0000	02260	FDB	\$0000	4A79	3844	03510	NINE	FDB	\$3844	4B75	0000	04780	FDB	\$0000	
4983	0000	02270	FDB	\$0000	4A7B	443C	03520		FDB	\$443C	4B77	0000	04790	FDB	\$0000	
4985	0000	02280	FDB	\$0000	4A7D	0444	03530		FDB	\$0444	4B79	3810	04800	CAP1	FDB	\$3810
4987	0000	02290	FDB	\$0000	4A7F	3800	03540		FDB	\$3800	4B7B	1010	04810	FDB	\$1010	
4989	1054	02300	ASTER	FDB	\$1054	4A81	0000	03550	FDB	\$0000	4B7D	1010	04820	FDB	\$1010	
498B	38FE	02310	FDB	\$38FE	4A83	0000	03560		FDB	\$0000	4B7F	3800	04830	FDB	\$3800	
498D	3854	02320	FDB	\$3854	4A85	0000	03570		FDB	\$0000	4B81	0000	04840	FDB	\$0000	
498F	0000	02330	FDB	\$1000	4A87	0000	03580		FDB	\$0000	4B83	0000	04850	FDB	\$0000	
4991	0000	02340	FDB	\$0000	4A89	0018	03590	COLON	FDB	\$0018	4B85	0000	04860	FDB	\$0000	
4993	0000	02350	FDB	\$0000	4A8B	1800	03600		FDB	\$1800	4B87	0000	04870	FDB	\$0000	
4995	0000	02360	FDB	\$0000	4A8D	0018	03610		FDB	\$0018	4B89	000A	04880	CAPJ	FDB	\$000A
4997	0000	02370	FDB	\$0000	4A8F	1800	03620		FDB	\$1800	4B8B	0404	04890	FDB	\$0404	
4999	1010	02380	PLUS	FDB	\$1010	4A91	0000	03630	FDB	\$0000	4B8D	0444	04900	FDB	\$0444	
499B	10FE	02390	FDB	\$10FE	4A93	0000	03640		FDB	\$0000	4B8F	3800	04910	FDB	\$3800	
499D	1010	02400	FDB	\$1010	4A95	0000	03650		FDB	\$0000	4B91	0000	04920	FDB	\$0000	
499F	1000	02410	FDB	\$1000	4A97	0000	03660		FDB	\$0000	4B93	0000	04930	FDB	\$0000	
49A1	0000	02420	FDB	\$0000	4A99	0018	03670	SEMICO	FDB	\$0018	4B95	0000	04940	FDB	\$0000	
49A3	0000	02430	FDB	\$0000	4A9B	1800	03680		FDB	\$1800	4B97	0000	04950	FDB	\$0000	
49A5	0000	02440	FDB	\$0000	4A9D	0018	03690		FDB	\$0018	4B99	42A4	04960	CAPK	FDB	\$42A4
49A7	0000	02450	FDB	\$0000	4A9F	1800	03700		FDB	\$1800	4B9B	0000	04970	FDB	\$0000	
49A9	0000	02460	COMMA	FDB	\$0000	4AA1	1000	03710	FDB	\$1000	4B9D	6844	04980	FDB	\$6844	
49AB	0000	02470	FDB	\$0000	4AA3	0000	03720		FDB	\$0000	4BA1	0000	04990	FDB	\$0000	
49AD	0018	02480	FDB	\$0018	4AA5	0000	03730		FDB	\$0000	4BA3	0000	05000	FDB	\$0000	
49AF	1800	02490	FDB	\$1800	4AA7	0000	03740		FDB	\$0000	4BA5	0000	05010	FDB	\$0000	
49B1	1000	02500	FDB	\$1000	4AA9	0810	03750	LESS	FDB	\$0810	4BA7	0000	05020	FDB	\$0000	
49B3	0000	02510	FDB	\$0000	4AAB	20A0	03760		FDB	\$20A0	4BA9	0000	05030	FDB	\$0000	
49B5	0000	02520	FDB	\$0000	4AAC	2010	03770		FDB	\$2010	4BAB	0404	05040	CAPL	FDB	\$0404
49B7	0000	02530	FDB	\$0000	4AAF	0800	03780		FDB	\$0800	4BAB	0404	05050	FDB	\$0404	
49B9	0000	02540	FDB	\$0000	4AB1	0000	03790		FDB	\$0000	4BAD	40A2	05060	FDB	\$40A2	
49BB	007C	02550	DASH	FDB	\$007C	4AB3	0000	03800	FDB	\$0000	4BAF	7000	05070	FDB	\$7000	
49BD	0000	02560	FDB	\$0000	4AB5	0000	03810		FDB	\$0000	4BB1	0000	05080	FDB	\$0000	
49BF	0000	02570	FDB	\$0000	4AB7	0000	03820		FDB	\$0000	4BB3	0000	05090	FDB	\$0000	
49C1	0000	02580	FDB	\$0000	4AB9	0000	03830	EQUAL	FDB	\$0000	4BB5	0000	05100	FDB	\$0000	
49C3	0000	02590	FDB	\$0000	4ABB	7C00	03840		FDB	\$7C00	4BB7	0000	05110	FDB	\$0000	
49C5	0000	02600	FDB	\$0000	4ABD	007C	03850		FDB	\$007C	4BB9	4266	05120	CAPM	FDB	\$4266
49C7	0000	02610	FDB	\$0000	4ABF	0000	03860		FDB	\$0000	4BBB	5A5A	05130	FDB	\$5A5A	
49C9	0000	02620	PERIOD	FDB	\$0000	4AC1	0000	03870	FDB	\$0000	4BD1	42A2	05140	FDB	\$42A2	
49CB	0000	02630	FDB	\$0000	4AC3	0000	03880		FDB	\$0000	4BD3	4200	05150	FDB	\$4200	
49CD	0018	02640	FDB	\$0018	4AC5	0000	03890		FDB	\$0000	4BD5	0000	05160	FDB	\$0000	
49CF	1800	02650	FDB	\$1800	4AC7	0000	03900		FDB	\$0000	4BD7	0000	05170	FDB	\$0000	
49D1	0000	02660	FDB	\$0000	4AC9	2010	03910	GREATR	FDB	\$2010	4BD9	0000	05180	FDB	\$0000	
49D3	0000	02670	FDB	\$0000	4ACB	0804	03920		FDB	\$0804	4BD7	0000	05190	FDB	\$0000	
49D5	0000	02680	FDB	\$0000	4ACD	0810	03930		FDB	\$0810	4BD9	4262	05200	CAPN	FDB	\$4262
49D7	0000	02690	FDB	\$0000	4ACE	2000	03940		FDB	\$2000	4BDB	524A	05210	FDB	\$524A	
49D9	0204	02700	SLASH	FDB	\$0204	4AD1	0000	03950	FDB	\$0000	4BDD	4642	05220	FDB	\$4642	
49DB	0810	02710	FDB	\$0810	4AD3	0000	03960		FDB	\$0000	4BDF	4200	05230	FDB	\$4200	
49DD	2040	02720	FDB	\$2040	4AD5	0000	03970		FDB	\$0000	4BD1	0000	05240	FDB	\$0000	
49DF	8000	02730	FDB	\$8000	4AD7	0000	03980		FDB	\$0000	4BD3	0000	05250	FDB	\$0000	
49E1	0000	02740	FDB	\$0000	4AD9	3844	03990	QUEST	FDB	\$3844	4BD5	0000	05260	FDB	\$0000	
49E3	0000	02750	FDB	\$0000	4ADB	0408	04000		FDB	\$0408	4BD7	0000	05270	FDB	\$0000	
49E5	0000	02760	FDB	\$0000	4ADD	1800	04010		FDB	\$1800	4BD9	3C42	05280	CAPQ	FDB	\$3C42
49E7	0000	02770	FDB	\$0000	4ADE	1000	04020		FDB	\$1000	4BDB	42A2	05290	FDB	\$42A2	
49E9	3844	02780	* ZERO	FDB	\$3844	4AE1	0000	04030	FDB	\$0000	4BDD	42A2	05300	FDB	\$42A2	
49EB	4444	02800	FDB	\$4444	4AE3	0000	04040		FDB	\$0000	4BDF	3C00	05310	FDB	\$3C00	
49ED	4444	02810	FDB	\$4444	4AE5	0000	04050		FDB	\$0000	4BE1	0000	05320	FDB	\$0000	
49EF	3800	02820	FDB	\$3800	4AE7	0000	04060		FDB	\$0000	4BE3	0000	05330	FDB	\$0000	
49F1	0000	02830	FDB	\$0000	4AE9	3852	04070	ATSIGN	FDB	\$3852	4BE5	0000	05340	FDB	\$0000	
49F3	0000	02840	FDB	\$0000	4AEB	A294	04080		FDB	\$A294	4BE7	0000	05350	FDB	\$0000	
49F5	0000	02850	FDB	\$0000	4AED	8842	04100		FDB	\$8842	4BE9	7C22	05370	CAPP	FDB	\$7C22
49F7	0000	02860	FDB	\$0000	4AEF	3C00	04110		FDB	\$3C00	4BEB	223C	05380	FDB	\$223C	
49F9	1030	02870	ONE	FDB	\$1030	4AF1	0000	04120	FDB	\$0000	4BED	2000	05390	FDB	\$2000	
49FB	1010	02880	FDB	\$1010	4AF3	0000	04130		FDB	\$0000	4BEF	7000	05400	FDB	\$7000	
49FD	1010	02890	FDB	\$1010	4AF5	0000	04140		FDB	\$0000	4BF1	0000	05410	FDB	\$0000	
49FF	3800	02900	FDB	\$3800	4AF7	0000	04150		FDB	\$0000	4BF3	0000	05420	FDB	\$0000	
4A01	0000	02910	FDB	\$0000	4AF9	1824	04160	CAPA	FDB	\$1824	4BF5	0000	05430	FDB	\$0000	
4A03	0000	02920	FDB	\$0000	4AFB	42A2	04170		FDB	\$42A2	4BF7	0000	05440	FDB	\$0000	
4A05	0000	02930	FDB	\$0000	4AFD	7E42	04180		FDB	\$7E42	4BF9	3C42	05450	CAPQ	FDB	\$3C42
4A07	0000	02940	FDB	\$0000	4AFF	4200	04190		FDB	\$4200	4BFB	42A2	05460	FDB	\$42A2	
4A09	3844	02950	TWO	FDB	\$3844	4B01	0000	04200	FDB	\$0000	4BFD	5A44	05470	FDB	\$5A44	
4A0B	0408	02960	FDB	\$0408	4B03	0000	04210		FDB	\$0000	4BFF	3A00	05480	FDB	\$3A00	
4A0D	3844	02970	FDB	\$3844	4B05	0000	04220		FDB	\$0000	4C01</					

4C4D	2418	05870	FDB	\$2418	4D49	1824	07140	MINF	FDB	\$1824	4E45	00000	08410	FDB	\$00000		
4C4F	1800	05880	FDB	\$1800	4D48	2038	07150		FDB	\$2038	4E47	00000	08420	FDB	\$00000		
4C51	0000	05890	FDB	\$00000	4D4D	2020	07160		FDB	\$2020	4E49	00000	08430	MINV	FDB	\$00000	
4C53	0000	05900	FDB	\$00000	4D4F	2000	07170		FDB	\$2000	4E4B	4444	08440	FDB	\$4444		
4C55	0000	05910	FDB	\$00000	4D51	0000	07180		FDB	\$00000	4E4D	4428	08450	FDB	\$4428		
4C57	0000	05920	FDB	\$00000	4D53	0000	07190		FDB	\$00000	4E4F	1000	08460	FDB	\$1000		
4C59	8282	05930	CAPW	FDB	\$8282	4D55	0000	07200		FDB	\$00000	4E51	0000	08470	FDB	\$00000	
4C5B	8292	05940		FDB	\$8292	4D57	0000	07210		FDB	\$00000	4E53	0000	08480	FDB	\$00000	
4C5D	9292	05950		FDB	\$9292	4D59	0000	07220	MING	FDB	\$00000	4E55	0000	08490	FDB	\$00000	
4C5F	6C00	05960		FDB	\$6C00	4D5B	3C44	07230		FDB	\$3C44	4E57	0000	08500	FDB	\$00000	
4C61	0000	05970		FDB	\$00000	4D5D	4244	07240		FDB	\$4244	4E59	0000	08510	MINW	FDB	\$00000
4C63	0000	05980		FDB	\$00000	4D5F	3C04	07250		FDB	\$3C04	4E5B	4444	08520	FDB	\$4444	
4C65	0000	05990		FDB	\$00000	4D61	4438	07260		FDB	\$4438	4E5D	5454	08530	FDB	\$5454	
4C67	0000	06000		FDB	\$00000	4D63	0000	07270		FDB	\$00000	4E5F	2800	08540	FDB	\$2800	
4C69	8244	06010	CAPX	FDB	\$8244	4D65	0000	07280		FDB	\$00000	4E61	0000	08550	FDB	\$00000	
4C6B	2810	06020		FDB	\$2810	4D67	0000	07290		FDB	\$00000	4E63	0000	08560	FDB	\$00000	
4C6D	2844	06030		FDB	\$2844	4D69	4040	07300	MINH	FDB	\$4040	4E65	0000	08570	FDB	\$00000	
4C6F	8200	06040		FDB	\$8200	4D6B	7844	07310		FDB	\$7844	4E67	0000	08580	FDB	\$00000	
4C71	0000	06050		FDB	\$00000	4D6D	4444	07320		FDB	\$4444	4E69	0000	08590	MINX	FDB	\$00000
4C73	0000	06060		FDB	\$00000	4D6F	4400	07330		FDB	\$4400	4E6B	4428	08600	FDB	\$4428	
4C75	0000	06070		FDB	\$00000	4D71	0000	07340		FDB	\$00000	4E6D	1028	08610	FDB	\$1028	
4C77	0000	06080		FDB	\$00000	4D73	0000	07350		FDB	\$00000	4E6F	4430	08620	FDB	\$4430	
4C79	8244	06090	CAPY	FDB	\$8244	4D75	0000	07360		FDB	\$00000	4E71	0000	08630	FDB	\$00000	
4C7B	2810	06100		FDB	\$2810	4D77	0000	07370		FDB	\$00000	4E73	0000	08640	FDB	\$00000	
4C7D	1010	06110		FDB	\$1010	4D79	1000	07380	MINI	FDB	\$1000	4E75	0000	08650	FDB	\$00000	
4C7F	1000	06120		FDB	\$1000	4D7B	3010	07390		FDB	\$3010	4E77	0000	08660	FDB	\$00000	
4C81	0000	06130		FDB	\$00000	4D7D	1010	07400		FDB	\$1010	4E79	0000	08670	MINY	FDB	\$00000
4C83	0000	06140		FDB	\$00000	4D7F	3800	07410		FDB	\$3800	4E7B	4444	08680	FDB	\$4444	
4C85	0000	06150		FDB	\$00000	4D81	0000	07420		FDB	\$00000	4E7D	4444	08690	FDB	\$4444	
4C87	0000	06160		FDB	\$00000	4D83	0000	07430		FDB	\$00000	4E7F	3C04	08700	FDB	\$3C04	
4C89	7E04	06170	CAPZ	FDB	\$7E04	4D85	0000	07440		FDB	\$00000	4E81	4438	08710	FDB	\$4438	
4C8B	0810	06180		FDB	\$0810	4D87	0000	07450		FDB	\$00000	4E83	0000	08720	FDB	\$00000	
4C8D	2040	06190		FDB	\$2040	4D89	1000	07460	MINJ	FDB	\$1000	4E85	0000	08730	FDB	\$00000	
4C8F	7E00	06200		FDB	\$7E00	4D8B	3010	07470		FDB	\$3010	4E87	0000	08740	FDB	\$00000	
4C91	0000	06210		FDB	\$00000	4D8D	1010	07480		FDB	\$1010	4E89	0000	08750	MINZ	FDB	\$00000
4C93	0000	06220		FDB	\$00000	4D8F	1010	07490		FDB	\$1010	4E8B	7C08	08760	FDB	\$7C08	
4C95	0000	06230		FDB	\$00000	4D91	9060	07500		FDB	\$9060	4E8D	1020	08770	FDB	\$1020	
4C97	0000	06240		FDB	\$00000	4D93	0000	07510		FDB	\$00000	4E8F	7C00	08780	FDB	\$7C00	
4C99	3820	06250	LBRACK	FDB	\$3820	4D95	0000	07520		FDB	\$00000	4E91	0000	08790	FDB	\$00000	
4C9B	2020	06260		FDB	\$2020	4D97	0000	07530		FDB	\$00000	4E93	0000	08800	FDB	\$00000	
4C9D	2020	06270		FDB	\$2020	4D99	4040	07540	MINK	FDB	\$4040	4E95	0000	08810	FDB	\$00000	
4C9F	3800	06280		FDB	\$3800	4D9B	4850	07550		FDB	\$4850	4E97	0000	08820	FDB	\$00000	
4CA1	0000	06290		FDB	\$00000	4D9D	6050	07560		FDB	\$6050	4E99	1820	08830	LBRACE	FDB	\$1820
4CA3	0000	06300		FDB	\$00000	4D9F	4800	07570		FDB	\$4800	4E9B	2040	08840	FDB	\$2040	
4CA5	0000	06310		FDB	\$00000	4DA1	0000	07580		FDB	\$00000	4E9D	2020	08850	FDB	\$2020	
4CA7	0000	06320		FDB	\$00000	4DA3	0000	07590		FDB	\$00000	4E9F	1800	08860	FDB	\$1800	
4CA9	0000	06330	BSLASH	FDB	\$00000	4DA5	0000	07600		FDB	\$00000	4EA1	0000	08870	FDB	\$00000	
4CAB	2010	06340		FDB	\$2010	4DA7	0000	07610		FDB	\$00000	4EA3	0000	08880	FDB	\$00000	
4CAD	0804	06350		FDB	\$0804	4DA9	3010	07620	MINL	FDB	\$3010	4EA5	0000	08890	FDB	\$00000	
4CAF	0200	06360		FDB	\$0200	4DAB	1010	07630		FDB	\$1010	4EA7	0000	08900	FDB	\$00000	
4CB1	0000	06370		FDB	\$00000	4DAD	1010	07640		FDB	\$1010	4EA9	0000	08910	LONGLN	FDB	\$00000
4CB3	0000	06380		FDB	\$00000	4DAF	3800	07650		FDB	\$3800	4EAB	00FF	08920	FDB	\$00FF	
4CB5	0000	06390		FDB	\$00000	4DB1	0000	07660		FDB	\$00000	4EAD	0000	08930	FDB	\$00000	
4CB7	0000	06400		FDB	\$00000	4DB3	0000	07670		FDB	\$00000	4EAF	0000	08940	FDB	\$00000	
4CB9	3808	06410	RBRACK	FDB	\$3808	4DB5	0000	07680		FDB	\$00000	4EB1	0000	08950	FDB	\$00000	
4CBB	0808	06420		FDB	\$0808	4DB7	0000	07690		FDB	\$00000	4EB3	0000	08960	FDB	\$00000	
4CBD	0808	06430		FDB	\$0808	4DB9	0000	07700	MINM	FDB	\$00000	4EB5	0000	08970	FDB	\$00000	
4CDB	3808	06440		FDB	\$3808	4DBB	7C52	07710		FDB	\$7C52	4EB7	0000	08980	FDB	\$00000	
4CC1	0000	06450		FDB	\$00000	4DBD	5252	07720		FDB	\$5252	4EB9	3008	08990	RBRACE	FDB	\$3008
4CC3	0000	06460		FDB	\$00000	4DBF	5200	07730		FDB	\$5200	4EBB	0804	09000	FDB	\$0804	
4CC5	0000	06470		FDB	\$00000	4DC1	0000	07740		FDB	\$00000	4EBD	0808	09010	FDB	\$0808	
4CC7	0000	06480		FDB	\$00000	4DC3	0000	07750		FDB	\$00000	4EBF	1800	09020	FDB	\$1800	
4CC9	1028	06490	CARAT	FDB	\$1028	4DC5	0000	07760		FDB	\$00000	4EC1	0000	09030	FDB	\$00000	
4CCB	4482	06500		FDB	\$4482	4DC7	0000	07770		FDB	\$00000	4EC3	0000	09040	FDB	\$00000	
4CCD	0000	06510		FDB	\$00000	4DC9	0000	07780	MINN	FDB	\$00000	4EC5	0000	09050	FDB	\$00000	
4CCF	0000	06520		FDB	\$00000	4DCB	5864	07790		FDB	\$5864	4EC7	0000	09060	FDB	\$00000	
4CD1	0000	06530		FDB	\$00000	4DCD	4444	07800		FDB	\$4444	4EC9	0000	09070	TILDE	FDB	\$00000
4CD3	0000	06540		FDB	\$00000	4DCF	4400	07810		FDB	\$4400	4ECB	6092	09080	FDB	\$6092	
4CD5	0000	06550		FDB	\$00000	4DD1	0000	07820		FDB	\$00000	4ECD	0C00	09090	FDB	\$0C00	
4CD7	0000	06560		FDB	\$00000	4DD3	0000	07830		FDB	\$00000	4ECF	0000	09100	FDB	\$00000	
4CD9	0020	06570	BKARRO	FDB	\$0020	4DD5	0000	07840		FDB	\$00000	4ED1	0000	09110	FDB	\$00000	
4CDB	40FE	06580		FDB	\$40FE	4DD7	0000	07850		FDB	\$00000	4ED3	0000	09120	FDB	\$00000	
4CDD	4020	06590		FDB	\$4020	4DD9	0000	07860	MIND	FDB	\$00000	4ED5	0000	09130	FDB	\$00000	
4CDF	0000	06600		FDB	\$00000	4DDB	3844	07870		FDB	\$3844	4ED7	0000	09140	FDB	\$00000	
4CE1	0000	06610		FDB	\$00000	4DDD	4000	07880		FDB	\$4000	4ED9	AA55	09150	DELETE	FDB	\$AA55
4CE3	0000	06620		FDB	\$00000	4DDF	3800	07890		FDB	\$3800	4EDB	09160	09170	FDB	\$AA55	
4CE5	0000	06630		FDB	\$00000	4DE1	0000	07900		FDB	\$00000	4EDD	AA55	09180	FDB	\$AA55	
4CE7	0000	06640		FDB	\$00000	4DE3	0000	07910		FDB	\$00000	4EDF	AA55	09190	FDB	\$AA55	
4CE9	0000	06650	CURSOR	FDB	\$00000	4DE5	0000	07920		FDB	\$00000	4EE1	AA55	09200	FDB	\$AA55	
4CEB	0000	06660		FDB	\$00000	4DE7	0000	07930		FDB	\$00000	4EE3	0000	09210	FDB	\$00000	
4CEC	0000	06670		FDB	\$00000	4DE9	0000	07940	*	FDB	\$00000	4EE5	0000	09220	FDB	\$00000	
4CED	0000	06680		FDB	\$00000	4DEB	5864	07950	MINP	FDB	\$5864	4EE7	0000	09230	*	FDB	\$00000
4CEF	00FE	06690		FDB	\$00FE	4DED	4444	07960		FDB	\$4444	4EE9	0000	09240	*	FDB	\$00000
4CF1	0000	06700		FDB	\$00000	4DEF	7840	07970		FDB	\$7840	4EEB	0000	09250	*	FDB	\$00000
4CF3	0000	06710		FDB	\$00000	4DF1	4040	07980		FDB	\$4040	4EEC	0000	09260	*	FDB	\$00000
4CF5	0000	06720		FDB	\$00000	4DF3	0000	07990		FDB	\$00000	4EED	0000	09270	*	FDB	\$00000
4CF7	00																

Continued from page 53

- To back up your complete system, text block included, choose Selection 9: Making a System Copy. This is a back-up copy of all the programs and text in memory. It is used to make copies of your original tape whenever back-ups are needed. Copies are made of the editor (as a Basic program with the name DRIVER), the scrolling and banner routines (as a machine language file with the name SCROLL), and the entire text and banners (as a machine language file with the name TEXT).

Special Functions

This is the Selection 7 I put off discussing earlier. Attractive displays can be

Figure 2. Special Functions Menu (Selection 7)

Special Functions

- (1) Normal, Black-on-white
- (2) Reverse, White-on-black
- (3) Set Vertical Line Spacing
- (4) Set Upper Border
- (5) Set Lower Border
- (6) Create Banners
- (7) Quit

Touch the number of your choice

produced by combining text with borders, banners and reverse lettering. Selection 7 provides much display flexibility, and also presents its own menu (Fig. 2).

- To select normal or reverse lettering, choose Special Selections 1 and 2. The scrolling text (not the banners) may be displayed in normal (black letters on white) or reverse (white letters on black). Selection 1 is normal, Selection 2 is reverse. Reverse letters can be used for effect, but require a television or monitor with good contrast and wide bandwidth. Experiment for best effect.

- To change the spacing between lines of text, choose Special Selection 3: Set Vertical Line Spacing. Normal text lines use a small amount of white space for legibility. However, denser or looser text can be obtained by changing the vertical spacing between letters. Special Selection 3 is normally set to display two thin lines of white between each line of text. This can be increased to a maximum of six lines for very widely spaced text, or decreased to one so the descenders of letters g, p, q and y almost touch the tops of capital letters on the lines below.

For special effects, the bottoms of letters can actually be cut off by the sub-

sequent line of text. Values -8 to 0 provide for total illegibility at one extreme (-8), to letters which simply touch each other (0).

Please turn the page

Figure 3. Screen Division

Upper border 1	_____
Upper border 2	_____
Upper border 3	_____
Upper border 4	_____
Upper border 5	_____
Upper border 6	_____
Upper border 7	_____
Upper border 8	_____
Upper border 9	_____
Upper border 10	_____
Upper border 11	_____
Upper border 12	_____
Lower border 12	_____
Lower border 11	_____
Lower border 10	_____
Lower border 9	_____
Lower border 8	_____
Lower border 7	_____
Lower border 6	_____
Lower border 5	_____
Lower border 4	_____
Lower border 3	_____
Lower border 2	_____
Lower border 1	_____

Technical Information

Scrolling Program is located from \$4800-\$48E8.

Entry point is \$4812.

End of text marker MSB is located at \$4804.

Screen size MSB is located at \$4810.

- Screen size is always defined as NORM1D-NORM06 + 1.

Upper banner is defined at \$4832 (NORM06) and \$4868 (NORM1E).

- NORM06 is normally \$06 and can be up to \$12 (half screen).

- NORM1E is normally \$1E and can be up to \$24 (half screen).

- Both of the above must define the same difference, i.e.,
NORM1E = NORM06 + \$18

Lower banner defined at \$4836 (NORM1D) and \$486C (NORM35).

- NORM1D is normally \$1D and can go to \$12 (half screen).

- NORM35 is normally \$35 and can go to \$24 (half screen).

- Both of the above must define the same difference, i.e.,
NORM35 = NORM1D + \$18

High-resolution screen 1 start MSB found at \$4832.

High-resolution screen 1 end MSB found at \$4836.

High-resolution screen 2 start MSB found at \$4868.

High-resolution screen 2 end MSB found at \$486C.

Line spacing is located at \$484A and \$487F (both the same).

- Line spacing range is \$0A to \$10 (overlap uses \$02-\$09).

Reverse lettering is located at \$40B1.

- Use \$43 for normal (default) and \$12 for reverse.

Alphanumeric Font located in ASCII order from \$48E9-\$4EE8.

Banner Program is located from \$4F00-\$4FA1.

Entry point is \$4F12.

Banner end value LSB found at \$4F05.

Banner text start pointer located at \$4F2D.

Reverse lettering is located at \$4F58.

- Use \$53 for normal and \$12 for reverse.

- This value is not changed by

DRIVER; use command POKES.

Line spacing is found at \$4F75.

- Use \$0B for normal (four blanks).

- This value is not changed by DRIVER; use command POKES.

Text Buffer is located from \$5000-\$7FFF.

\$5000-\$501F is always a blank line (\$20).

Note: The text editor (Basic driver) of the Video Display Scroller is used most easily with a true lowercase generator installed in your Color Computer, because all prompts are printed in upper- and lowercase and the text editing is displayed in this manner. Although the Video Display Scroller's final display uses true software-generated lowercase characters, Radio Shack's Basic does not. To obtain true lowercase in Basic, you must have a true lowercase generator; one will be presented in Custom Color this fall, but in the meantime the Word Processing Lowerkit can be obtained from World Electronics, 177 27th Street, New York 11232, (212) 499-5400. Call for pricing.

Program Listing 3

Circle No. 40 on Reader Service Card

Listing 3. Banner-creation program sits just at the end of the character font; it occupies only 161 bytes.

4F	00100	SETDP	\$4F
4F00	00110 *		
	00120	ORG	\$4F00
	00130 *		
4F00	00140 VINDEX1	FDB	\$0600
4F02	1E00 00150 VINDEX2	FDB	\$1E00
4F04	7F40 00160 ENDBN1	FDB	\$7F40
4F06	7F80 00170 ENDBN2	FDB	\$7F80
4F08	7F40 00180 ENDBAN	FDB	\$7F40
4F0A	0000 00190 NODOTS	FDB	\$0000
4F0C	02 00200 DUBLER	FCB	\$02
4F0D	10 00210 NOCHRS	FCB	\$10
4F0E	0000 00220 STOREB	FDB	\$0000
4F10	0000 00230 STOREY	FDB	\$0000
	00240 *		
	7F00 00250 BANTBL	EQU	\$7F00
48E9	00260 ASCII	EQU	\$48E9
	00270 *		
4F12 B6	4F 00280 ENTRY	LDA	#\$4F
4F14 1F	8B 00290	TFR	A, DP
	00300 *		
4F16 109E 04	00310	LDY	<ENDBN1
4F19 109F 08	00320	STY	<ENDBAN
4F1C 109E 00	00330	LDY	<VINDEX1
4F1F 8D 0A	00340	BSR	UBANR
4F21 109E 02	00350	LDY	<VINDEX2
4F24 8D 05	00360	BSR	UBANR
4F26 86 00	00370	LDA	#\$00
4F28 1F 8B	00380	TFR	A, DP
4F2A 39	00390	RTS	
	00400 *		
4F2B 8E 7F00	00410 UBANR	LDX	#BANTBL
4F2E 86 00	00420 GETMOR	LDA	#\$00
4F30 97 0B	00430	STA	<NODOTS+1
4F32 86 02	00440 GETSET	LDA	#\$02
4F34 97 0C	00450	STA	<DUBLER
4F36 86 10	00460 GETPOS	LDA	#\$10
4F38 97 0D	00470	STA	<NOCHRS
4F3A E6 80	00480 GETCHR	LDB	, X+
4F3C C0 20	00490	SUBB	#\$20
4F3E 86 00	00500	LDA	#\$00
4F40 58	00510	ASLB	
4F41 49	00520	ROLA	
4F42 58	00530	ASLB	
4F43 49	00540	ROLA	
4F44 58	00550	ASLB	
4F45 49	00560	ROLA	
4F46 58	00570	ASLB	
4F47 49	00580	ROLA	
4F48 D3 0A	00590	ADDD	<NODOTS
4F4A C3 48E9	00600	ADDD	#ASCII
4F4D 109F 10	00610	STY	<STOREY
4F50 1F 02	00620	TFR	D, Y
4F52 E6 A4	00630	LDB	, Y
4F54 109E 10	00640	LDY	<STOREY
4F57 53	00650	COMB	
4F58 D7 0E	00660	STB	<STOREB
4F5A D7 0F	00670	STB	<STOREB+1
4F5C 8D 2B	00680	BSR	EXPAND
4F5E A7 A0	00690	STA	, Y+
4F60 8D 27	00700	BSR	EXPAND
4F62 A7 A0	00710	STA	, Y+
4F64 0A 0D	00720	DEC	<NOCHRS
4F66 26 D2	00730	BNE	GETCHR
4F68 0A 0C	00740	DEC	<DUBLER
4F6A 27 04	00750	BEQ	CHKDOT
4F6C 8D 13	00760	BSR	TRNSFR
4F6E 20 C6	00770	BRA	GETPOS
4F70 0C 0B	00780 CHKDOT	INC	<NODOTS+1
4F72 96 0B	00800	LDA	<NODOTS+1
4F74 81 0C	00810 CMPA		#\$0C
4F76 27 04	00820	BEQ	CHKEND
4F78 8D 07	00830	BSR	TRNSFR
4F7A 20 B6	00840	BRA	GETSET
4F7C 9C 08	00850 CHKEND	CMPX	<ENDBAN
4F7E 26 AE	00860	BNE	GETMOR
4F80 39	00870	RTS	
	00880 *		
4F81 1F 10	00890 TRNSFR	TFR	X, D
4F83 83 0010	00900	SUBD	#\$10
4F86 1F 01	00910	TFR	D, X

Please turn the page

COLOR COMPUTER SOFTWARE

COMPLETE YOUR WORD PROCESSOR

SPELL—RITE

THE Cassette Spelling Verifier

You've got the best word processor. Now complete your system with the best spelling verifier. Spell-Rite is a convenient, fast way to insure that all of your documents are letter perfect. Spell-Rite was designed specifically for cassette-based word processors. Like Yours!

Spell-Rite is easy to use, completely menu driven.

Spell-Rite is Fast! You can verify a 1000 word document in under 9 minutes - including cassette I/O.

Spell-Rite is complete. It comes with its own 10,000+ word dictionary which you can expand. Also included is a superb manual.

Spell-Rite works with any word processor that generates ASCII tape files, such as Color Scripsit, Super Color Writer and Telewriter 64. 32K of RAM and Extended Basic are required.

Cassettes and manual \$59.95

DISK BASIC AID

DISK BASIC
MADE BETTER

Your Color Disk Basic is one of the most powerful Basics on any computer. Add Disk Basic Aid and it also becomes one of the easiest to use! The Basic Aid package will make developing and entering Basic programs a snap. Here are just *SOME* of the great features Basic Aid contains.

- Full Screen Editing
- Automatic Line Numbering
- 2 Key entry of Basic keywords
- Cross Reference
- Automatic Key Repeat
- User definable keys

PLUS. Label support! This unique Basic Aid feature is a vast improvement in the Basic language. Label any line you want and use that label in all calls to that line. Forget about line numbers. just call routines by name like this:

"ON A GOTO ENTERCHECKS, PAYABLES, EXIT"

A real time saver. And for transportability Basic Aid will convert all labels to line numbers.

These and other great features make Basic Aid a 'must' for anyone who writes or modifies Basic programs. Basic Aid runs on 32K or 64K Disk systems. It comes with complete documentation and our new, heavy duty keyboard overlay.

Disk Basic Aid \$49.95

SPECTRUM — STICK

Put the joy back into color computing with the Spectrum Stick. This heavy duty joystick gives you a true feel of control. And it comes with an extra long cable and power on/off LED.

the feeling of this joystick is superb. March 1983. 80-Micro

TX: add sales tax \$39.95

Send check or money order for total purchase price, plus \$1.50 S & H. Charge cards: Include all embossed information.

- ☐ Spell-Rite ☐ Disk Basic Aid
☐ Spectrum Stick ☐ Send Free Catalog

SEND to

**Eigen
Systems**

P.O. Box 180006
Austin, Texas 78718
(512) 837-4665

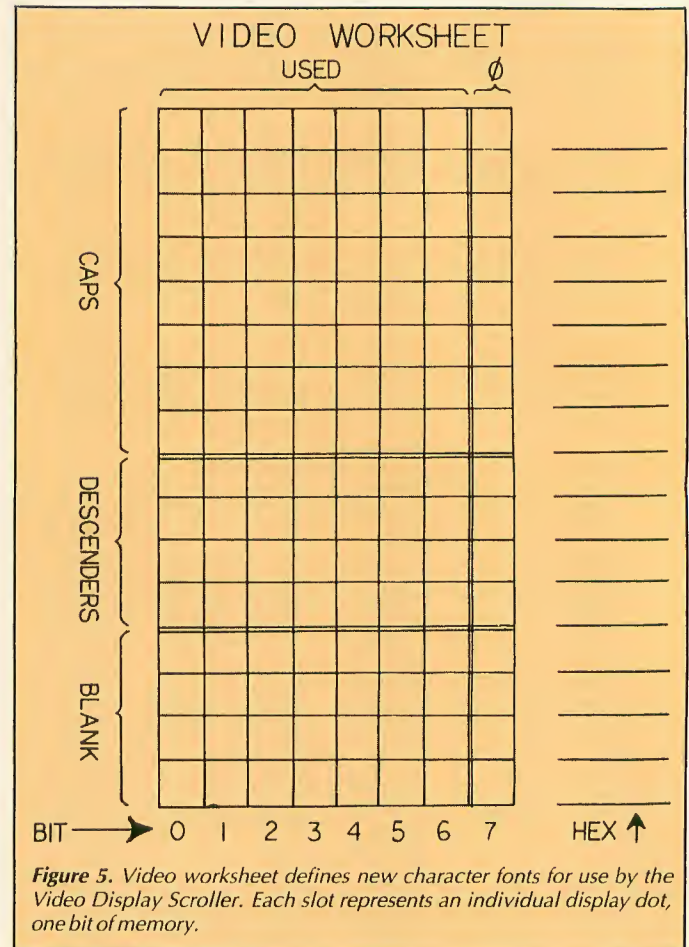
Name _____

Address _____

C _____

M _____

4F88	39		00920		RTS	
			00930	*		
4F89	08	0E	00940	EXPAND	ASL	<STOREB
4F8B	49		00950		ROLA	
4F8C	08	0F	00960		ASL	<STOREB+1
4F8E	49		00970		ROLA	
4F8F	08	0E	00980		ASL	<STOREB
4F91	49		00990		ROLA	
4F92	08	0F	01000		ASL	<STOREB+1
4F94	49		01010		ROLA	
4F95	08	0E	01020		ASL	<STOREB
4F97	49		01030		ROLA	
4F98	08	0F	01040		ASL	<STOREB+1
4F9A	49		01050		ROLA	
4F9B	08	0E	01060		ASL	<STOREB
4F9D	49		01070		ROLA	
4F9E	08	0F	01080		ASL	<STOREB+1
4FA0	49		01085		ROLA	
4FA1	39		01090		RTS	
			01100	*		
	4F12		01110		END	ENTRY
00000 TOTAL ERRORS						



- To set top and bottom borders, choose Special Selections 4 and 5: Borders. There are several reasons to set borders: to shorten the amount of text displayed, to outline the displayed text in black, to speed the text display, and to make room for banners.

From 12 to 20 lines of text are normally scrolled slowly from the bottom of the screen to the top. It takes slightly less than a minute for a full screen to pass. This is a lot of information, and some viewers may find a full screen difficult to read. To avoid a full screen, upper and lower borders can be set up.

The screen is divided into 24 parts, as shown in Fig. 3. (See page 56.)

Selection 4 sets the upper border, from the top down, and Selection 5 sets the lower border, from the bottom up. When creating banners, allow three border lines for each line of banner text, plus as many extra border lines as necessary to provide a legible image.

- To create banners at the borders of a screen, choose **Special Selection 6: Banners**. Banners are made of large display letters (double the normal height and width). Each banner line occupies an

eighth of the screen, and can contain up to 16 letters.

The arrangement of banner lines is shown in Fig. 4.

Figure 4. Banner Line Arrangement

Upper Banner Line 1	
Upper Banner Line 2	
Upper Banner Line 3	
Upper Banner Line 4	
Lower Banner Line 1	
Lower Banner Line 2	
Lower Banner Line 3	
Lower Banner Line 4	

The topmost banner line is Upper Banner Line 1, and the bottommost banner line is Lower Banner Line 4. Keep this in mind when entering banner information. Note also that all four lines of each banner must be filled in (even with only a carriage return) before the Special Functions menu will be returned. As a reminder of the length of the banner line, 16 numbers (corresponding to the numbered banner row) are shown, with the cursor positioned above the first. As usual, backspacing corrects errors.

- To return to the main Functions menu, choose Special Functions Selection 7: Quit. The main functions menu will be returned to permit continued entry of text, editing, saving or loading text, clearing memory, producing a final display, or using the system functions.

There is also a special system function within the special functions menu. It is used to produce a final display-only tape for 32K slave display machines. To create a master display tape, choose Special Selection 9: Display Tape. A tape must already be inserted in a cassette recorder, and the cassette recorder placed in record mode. A tape will be created containing the scrolling and banner programs and the complete text; it is a long process and will take several minutes to complete. To use the completed tape on any TRS-80 32K Color Computer, type:

CLOADM ENTER
The name X will be displayed, and after several minutes the OK prompt will return. Type:

EXEC ENTER
The display program will be enabled and operating.

It is wise to create the final display tape immediately after finishing the entry of text and creation of the banners. ■ ■ ■

COLOR COMPUTER/TDP-100* **SUPER-PRO** REPLACEMENT KEYBOARD KIT



*Computers produced after approximately October 1982 require an additional keyboard plug adapter. Please add \$4.95.

- Affordable Price—**Only \$69.95.**
- A **must have** for all serious computerists.
- Highest quality—U.S. made.
- Direct replacement—same key layout
- Professional appearance and operation.
- Fast, simple installation.
- Complete instructions included.
- In stock now.

AT YOUR FAVORITE DEALER OR DIRECT FROM



Mark Data Products

24001 ALICIA PKWY., NO. 226, MISSION VIEJO, CA 92691 • (714) 768-1551

We pay shipping on all orders in the continental U.S. and Canada. Overseas add \$5.00 for shipping and handling. Foreign orders please remit U.S. funds. California residents, please add 6% sales tax. We accept MasterCard and VISA. We are always looking for quality machine language programs. Contact us for details.



Sweet Add-A-Line

A technological advance for shoebox bookkeepers.

by **Richard Ramella**

CHAOS CAN BE TRANSFORMED into clarity and order with this short recordkeeping program that turns a shoebox of money records into a neat, categorized, totaled list. You'll love it at tax time.

Sweet Add-A-Line requires 16K Extended Color Basic and a line printer.

I originally called it the shoebox program because all year long I throw receipts, check records and such into a box with no thought of what lies in wait at tax time. The program was so useful in plowing through this mess, I decided it needed a sibilantly dulcet name. Sweet Add-A-Line says it all.

Take a look at the short Sample Run; to see it is to understand it all.

The program presents a series of numbered prompts, I answered the prompts as shown in Photo 1. I answered the fifth prompt by typing END and pressing Enter; this sets the program to work categorizing, totaling, and listing. It produces the printout in Figure 1.

Figure 1

POSTAGE
1.23 Decoder Ring Offer
8.90 Due on Decoder Ring
10.13—Total

REPAIR
2.67 New Shoelaces
5.66 Jim's Fixit
8.33

What happened there? Consider that the program *regards each entry* as having three fields. For example, the information in the photo is divided this way: (1.23) (POSTAGE) (DECODER RING

OFFER). The first is an amount to be added into a category. The second is the category. The third is merely a comment. When you ask for a printout, the program searches through the entries you've made and isolates all with the same second field. It then prints and totals all the amounts in the first field.

The program allows up to 100 entries. At the beginning and anytime you ask for it later, you will be shown the menu — a list of commands that help you manage the list. At any item entry prompt, you can type one of the menu words with different results:

- MENU — Displays the menu, which is exited by pressing Enter.
- END — Starts output to the printer. Make sure the printer is on.
- EDIT — It asks *which* item. Enter its number. It displays that item as *old entry* and prints on the line below *new entry* with a prompt. If you decide the old entry is correct, answer the prompt by typing OK and Enter. In this way, no change is made and you return to the regular entry mode.
- LOOK — Asks which item you want to see. Answer by typing the item number and pressing Enter. It then displays the entry you requested, plus the next seven entries. This makes it easy to find an item you want to edit and to doublecheck all entries for mistakes. After the list of eight appears, the program returns to the regular entry mode.

That's all there is to the menu. There are also a few safeguards against mistakes, though not all miscues are caught.

If you press Enter without making an entry, the program notes MORE INFORMATION NEEDED HERE and prints the same numbered prompt again.

If your entry does not contain at least two spaces, you are told SPACING ERROR. EDIT NOW PLEASE. This catches some of the errors and checks to ensure you have provided at least three fields. Without three fields to check, the program may hang up in the printout process and you will lose the data.

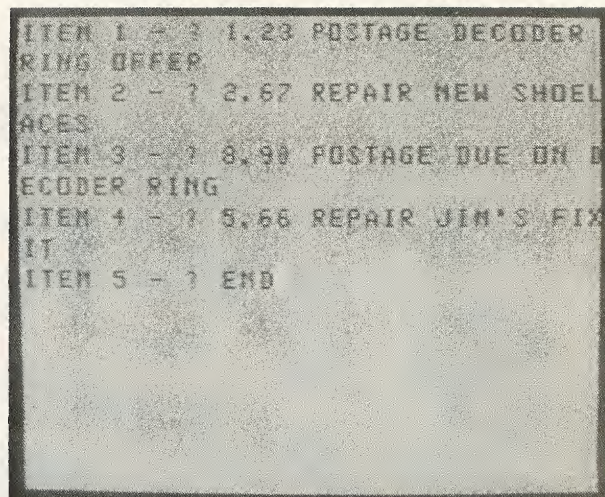
If your entry has fewer than 10 characters, the program adds a few dashes to help with string manipulation.

I advise you to make your categories — the second field — three-letter codes. I also advise you to keep the third field — comments — to 30 or fewer characters. In the tests I ran, the program capably handles 100 entries if you follow these guidelines, but if you make long comments, you might run out of memory before producing a printout.

Sweet Add-A-Line is a lifesaver at tax time. I throw in everything: deductions, salary, tax withheld...and get a perfect total for each. You can also use it as a simple bookkeeping system by using only two middle field categories: Debit and Credit. To put a year's months in order, make the first 12 entries 0 JAN BLANK and so on to 0 DEC BLANK. Then enter everything else with the middle field reserved for the three-letter month codes, and the printout will put the months in order. Disregard the zero totals, of course.

Other applications will occur to you: simple inventories, classifying collections, and so on. Sweet Add-A-Line will work for you whenever you need to classify and total records.

Usually, the command PRINT MEM results in the number 8487, which is bytes available when you turn on a 16K Extended Color Basic machine. Because



Sweet Add-A-Line uses no graphics and requires much string space, lines 110 PMODE 0 and 120 PCLEAR 1 make a total of 13095 bytes available for your use.

In writing Sweet Add-A-Line, I made a curious discovery which gives more proof of the Color Computer's power. I first wrote the program on a 16K TRS-80 Model I. It worked but was no good because by the time I got to the 30th entry, the system began to hang up and lag in its responses. The 12 second waits made me realize I'd never finish 100 items.

I knew what the problem was. Basic has a dynamic string allocation feature, and when things get crowded, it takes longer and longer for the strings to reorganize themselves. It seemed to call for a machine language subroutine of which I was incapable.

Sadly, but with hope, I keyed the program into the Color Computer. Lo, it worked! Technically, I don't know why. But, frankly, my dear Sweet Add-A-Line, I don't care as long as you do the job. ■ ■ ■

Listing begins page 62

Figure 2: Sample Run

.20 Pos Letter To Color Computer Magazine

6.97 Com Radio Shack Tapes

.20 Pos Letter To Santa Claus

12.33 Com Lineprinter Ribbons

200.33 Pay Programming For Atlantic Cookie Co.

5.12 Pos Manuscript To N.E.P.

37.83 Pay Mortgage Tables For Time Realty

23.45 Com Radio Shack Diskettes

Figure 3: Printed Result

—POS—

0.20 Letter To Color Computer Magazine

0.20 Letter to Santa Claus

5.12 Manuscript to N.E.P.

5.52—Total

—COM—

6.97 Radio Shack Tapes

12.33 Lineprinter Ribbons

23.45 Radio Shack Diskettes

42.75—Total

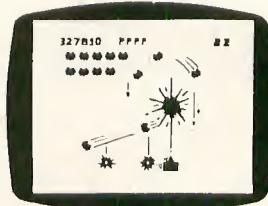
—PAY—

200.53 Programming for Atlantic Cookie Co.

37.83 Mortgage Tables for Time Realty

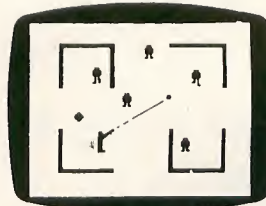
238.36—Total

Circle No. 42 on Reader Service Card



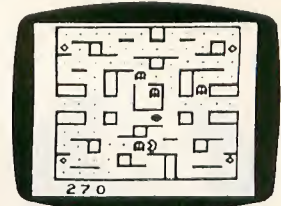
GALAX ATTAX

If you like Space Invaders, you'll love Galax Attax! Alien fighters leave formation to attack your ground base and you must fight them off! Exciting, fast-action machine language game with super sound and high resolution graphics. 16K and joysticks required. **26.95**



ROBOT BATTLE

Can you dodge the never ending horde of robots while avoiding the fatal touch of the Android? Realistic voices and 16 skill levels provide a tremendous arcade type challenge. Joysticks. **26.95**



GHOST GOBBLER

An exciting version of the popular PAC-MAN game with power dots, 8 bonus shapes, super sound and 16 skill levels. Hours and hours of challenging fun. Joysticks. **26.95**

INTERNATIONAL SOFTWARE INC.

771, Hockley Avenue, Victoria, B.C. V9B 2V5

Info Line (604) 474-2271

SPACE WAR

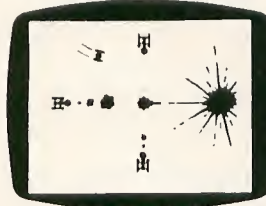
Maneuver your spaceship through the defenses of the Death Star for the killing shot while avoiding space mines, enemy ships and the gravity pull of the BLACK HOLE. Two Color hi-res graphics. Joysticks. **26.95**

COSMO ZAP

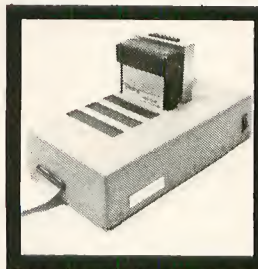
Super new space game! You must dodge the incoming photon torpedos before they can penetrate the defenses of your ship. Once you think you've got the upper hand, defensive fighters may appear and attack. **12.95**

COSMIC INVADERS

The best invaders type game available. Complete with 16 skill levels, dynamite sound and 4 color hi-res graphics. Can you dodge the bombs long enough to blast the alien ship and invaders? **26.95**



Switchable Expansion Is Here



A PERFECT COMPANION FOR COCO

The key to versatility is the new BT-2000 COMPANION. •Load 5 cartridges and enjoy the benefits of Push-Button selection. •SAVE CoCo's connector. Reduce plugging. •Indicator lights, know at a glance which cartridge is in use. •No more Turn-Offs. Switch to the next cartridge in your COMPANION. •Push a button to RESTART without turning power ON and OFF.

\$249.95.

FOR THE ADVANCED USER AND EXPERIMENTER

The utmost in power and versatility is the BT-1000 Expansion Interface Unit. •Built in supply to power your peripherals or experimenter circuits. •5 Expansion slots --- Internal memory decoding. •Space for your ML utilities in EPROM or optional RAM. \$270.00.

Or with 8K of RAM, \$300.00.

Write now for FREE brochure. Add \$5.00 s & h. Check, money order, VISA, MC (Account no. and expir. date). COD charge \$2.00 (req's certified check or money order). Mich. residents add 4% sales tax.

Also for CoCo:

BT-1010 Parallel Printer Interface \$79.95

BT-1020 Real Time Clock/Calendar \$109.00

BT-1030 Versatile Interface Port \$69.95

basic
TECHNOLOGY

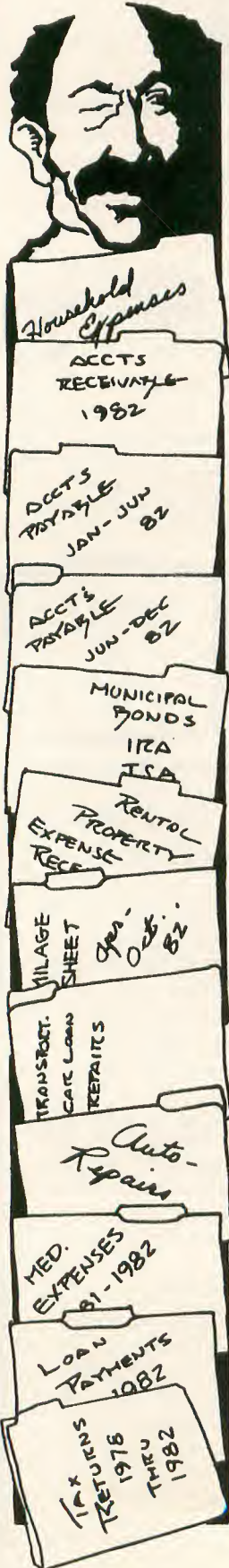
Dept. C P.O. Box 511 Ortonville, MI 48462

(313) 627-6146

Circle No. 43 on Reader Service Card

Color Computer/61

Sweet Add-a-Line



```

100 REM * SWEET ADD-A-LINE * TRS
-80 EXTENDED COLOR BASIC / RICHARD RAMELLA
110 PMODE 0
120 PCLEAR 1
130 CLS
140 CLEAR 9000
150 DIM A$(100),B$(100),C(100)
160 G$="#####.##"
170 L$=STRING$(31,"-")
180 GOSUB 820
190 A=1
200 PRINT "ITEM"A"- ";
210 INPUT A$(A)
220 IF A=100 THEN A$(A)="END"
230 IF A$(A)="" THEN PRINT "MORE INFORMATION NEEDED HERE.": GOTO 200
240 IF A$(A)="MENU" GOSUB 820: GOTO 200
250 IF A$(A)="EDIT" GOTO 650
260 IF A$(A)="END" THEN CLS: PRINT "PRINTED TOTALS IN PROGRESS": PRINT: PRINT: GOTO 360
270 IF A$(A)="LOOK" GOTO 560
280 GOSUB 770
290 IF S<2 THEN PRINT "SPACING ERROR. EDIT NOW PLEASE.": S=0: GOTO 200 ELSE S=0
300 IF LEN(A$(A))<10 THEN A$(A)=A$(A)+" "+STRING$(9-LEN(A$(A)),"-")
310 FOR B=2 TO LEN(A$(A))
320 IF MID$(A$(A),B,1)=" " THEN C(A)=VAL(LEFT$(A$(A),B-1)): B$(A)=RIGHT$(A$(A),LEN(A$(A))-B): GOTO 340
330 NEXT B
340 A=A+1
350 GOTO 200
360 FOR B=1 TO A-1
370 IF A$(B)="" THEN N=N+1: GOTO 410
380 IF Z$="" GOSUB 530
390 IF Z$=LEFT$(B$(B),LEN(Z$)) THEN PRINT #-2,USING G$;C(B);: PRINT #-2," "RIGHT$(B$(B),LEN(B$(B))-LEN(Z$)): H=H+C(B): N=N+1: A$(B)=""
400 IF B=A-1 GOTO 420
410 NEXT B
420 PRINT #-2,STRING$(30,"-")
430 PRINT #-2,USING G$;H;
440 PRINT #-2,"----- TOTAL"
450 PRINT #-2," "
460 PRINT #-2," "
470 PRINT #-2," "
480 IF N=A-1 THEN PRINT "SWEET ADD-A-LINE DID ITS JOB. END OF RUN": END
490 N=0
500 H=0
510 Z$=""
520 GOTO 360
530 FOR D=2 TO LEN(B$(B))
540 IF MID$(B$(B),D,1)=" " THEN

```

```

Z$=LEFT$(B$(B),D-1): PRINT #-2,"
---"Z$"---": PRINT #-2," ": RETURN
550 NEXT
560 INPUT "WHICH";J
570 J=INT(J)
580 IF J<1 OR J>A-1 GOSUB 750: GOTO 200
590 IF J+9>A-1 THEN K=A-1 ELSE K=J+9
600 CLS
610 FOR L=J TO K
620 PRINT L-"A$(L)
630 NEXT
640 GOTO 200
650 INPUT "WHICH";J
660 J=INT(J)
670 IF J>A-1 GOSUB 750: GOTO 200
680 IF J<1 GOSUB 750: GOTO 200
690 T$=A$(J)
700 PRINT "OLD ENTRY: "A$(J)
710 INPUT "NEW ENTRY";A$(J)
720 IF A$(J)="OK" THEN A$(J)=T$
730 IF LEN(A$(J))<10 THEN A$(J)=A$(J)+" "+STRING$(9-LEN(A$(J)),"-")
740 GOTO 200
750 PRINT "THAT NUMBER YET TO BE REACHED."
760 RETURN
770 FOR U=1 TO LEN(A$(A))
780 IF MID$(A$(A),U,1)=" " THEN S=S+1
790 NEXT
800 RETURN
810 END
820 CLS
830 PRINT "SWEET ADD-A-LINE MENU"
840 PRINT STRING$(21,"*")
850 PRINT
860 PRINT "END - OUTPUTS TO PRINTER"
870 PRINT L$
880 PRINT "MENU - SHOWS MENU"
890 PRINT L$
900 PRINT "EDIT - ASKS WHICH LINE TO EDIT"
910 PRINT " THEN PRESENTS LINE"
920 PRINT " FOR NEW VERSION."
930 PRINT L$
940 PRINT "LOOK - ASKS FIRST ITEM, PRINTS"
950 PRINT " IT PLUS NEXT 7 ITEMS"
960 PRINT L$
970 PRINT
980 PRINT "PRESS ANY KEY TO EXIT"
990 IF INKEY$<>"" THEN CLS: RETURN ELSE 990
1000 END

```


COLORSOFT™ BUSINESS SOFTWARE

AT LAST! BUSINESS SOFTWARE DESIGNED FOR THE COLOR COMPUTER

- ★ MAKE YOUR COLOR COMPUTER A WORKING BUSINESS PARTNER ★
- ★ ALL PROGRAMS ARE MENU DRIVEN AND USER FRIENDLY ★
- ★ PROFESSIONALLY WRITTEN AND FULLY TESTED ★
- ★ AFTER-THE-SALE SUPPORT ★

SMALL BUSINESS ACCOUNTING PACKAGE...Ideally suited for any small business with up to \$1,000,000 in annual sales and 400 accounts receivable and 400 accounts payable. This package provides detailed record keeping on accounts receivable and payable, sales, purchase orders, and allows input and maintenance of payroll related data. Prepares balance sheet and income statement, aging reports, and displays a check register, a listing of sales by date, and a listing of individual purchase orders. Included are printer output options. The step-by-step user's manual and the user friendly, menu driven format makes this program package fast, efficient, and easy to use.
REQUIRES SINGLE DISK DRIVE (User's manual without program \$20).....**\$149.95**

DEPRECIATION...Determines depreciation values for assets based upon the new accelerated cost recovery system (ACRS) and the alternate ACRS methods in addition to the conventional methods. Adjusts for placing assets in service during the year. Screen or printer output.....**\$22.95**

LOAN ANALYSIS...Evaluate cost of borrowing for capital investments or business expansion. Prints amortization schedules and allows user to determine loan status at any point in the term of a loan. Other options allow user to determine either principle, interest, payment, or term based upon input of any three. An auto loan option includes trade-in allowance and taxes. Screen or printer output.....**\$20.95**

ANNUITY...Determine future value of investments, present value of a future amount, compound interest, and amount of an individual retirement account (IRA). Screen or printer output.....**\$18.95**

EXPENSE ACCOUNT DIARY...Keeps a record of travel expenses for up to 25 trips per year. Performs file searches based upon cross-referencing of date of trip, city visited, hotel, or purpose of trip. Screen or printer output. An excellent program for the traveling businessman.....**\$15.95**

STOCK ANALYZER...Reviewed in July 1982 RAINBOW. New version provides printer output and is disk compatible. Maintains a stock portfolio data base of multiple stocks. Can be used to track performance of sales personnel or similar applications. Features graphing of data to screen or printer along with analyses that includes projection of data trends.....**\$21.95**

**COLOR
SOFTWARE
SERVICES**

INCLUDE \$2.25 HANDLING PER ORDER
ALL PROGRAMS REQUIRE 16K EXT. BASIC
CUSTOM PROGRAMMING SERVICES AVAILABLE
WRITE FOR FREE CATALOG

TELEPHONE ORDERS
(214) 454-3674
9-4 Monday-Saturday

BUSINESS SOFTWARE DIV.
P.O. BOX 1708, DEPT. C
GREENVILLE, TEXAS 75401

DEALER INQUIRES INVITED

VISA/MASTERCARD

Rectangles

Pretty pictures for your viewing pleasure.



16K Extended
Color Basic

by Lynn Davis

I HAVE ALWAYS been interested in short graphics programs — they're easy to type in, pack together many techniques, and are just plain fun to watch.

This program was originally written for the TRS-80 Models I and III, and appeared in the July 1981 issue of *Creative Computing*. I have modified the program to run on a 16K Extended Color Basic computer.

The Program Listing produces rectangles of random size and colors, and constructs them at random positions on the CRT. The rectangles will either be a solid color, or made up of a series of lines. This produces a spectacular effect.

Line By Line

Line 90 seeds the random number generator with a truly random number.

Line 100 selects the resolution of the graphics, clears the screen to a green background color, and establishes the color set used.

Line 110 sets certain variables to zero.

The random numbers generated in lines 120 and 130 are the horizontal and vertical coordinates of the rectangle to be constructed.

The random numbers produced in line 140 will be used in lines 170 and 180 to help calculate the size of a loop step.

Line 145 randomly determines a rectangle's color. With a green background, the rectangle colors can be yellow (number 2), blue (3), or red (4).

Line 150 contains a counter that clears the screen after 100 rectangles have been drawn.

Line 160 uses the counter number

from line 150. If the counter number (Z) is even, then ZZ has a value of 1. If Z is an odd number, then ZZ has a value of 0 (zero).

This value for ZZ (either a zero or a one), is later used in line 190 in the branch `ON ZZ GOTO 200`. If you have ever wanted a program branch that went in one direction on even numbers and went in another direction on odd numbers, this is one technique to use.

Lines 170 and 180 are loops that establish the direction of the construction and how close to construct the graphics blocks.

Look at the formula used to calculate the STEP, especially the $(A > B)$ section. This is not a misprint! The Color Computer interprets a greater than symbol, when used in a formula, as follows:

If $A > B$ then the $(A > B)$ part of the formula equals -1.

If $A < B$ then the $(A > B)$ part of the formula equals 0.

When these numbers are calculated into the rest of the STEP formula, the resulting step values are between +3 and -3, but not zero.

A step of 1 results in graphic blocks drawn next to each other, or a solid colored rectangle. A step of 2 or 3 results in the graphic blocks being drawn with one or two spaces between them, and will appear as lines.

The positive or negative values of the step determines whether the blocks are

constructed up or down the screen; and also determines whether the blocks are constructed from left to right across the screen.

Line 190 utilizes the 1 or 0 value for ZZ as determined in line 160. If $ZZ = 1$ then the program will GOTO line 200 and PSET the appropriate graphic block. If $ZZ = 0$ then the first statement in line 190 defaults and the computer PRESETs the graphic block and will GOTO line 210.

Line 210 completes the rectangle's construction by looping through the various FOR...NEXT statements. When complete, the program will GOTO line 120 and start construction of another rectangle.

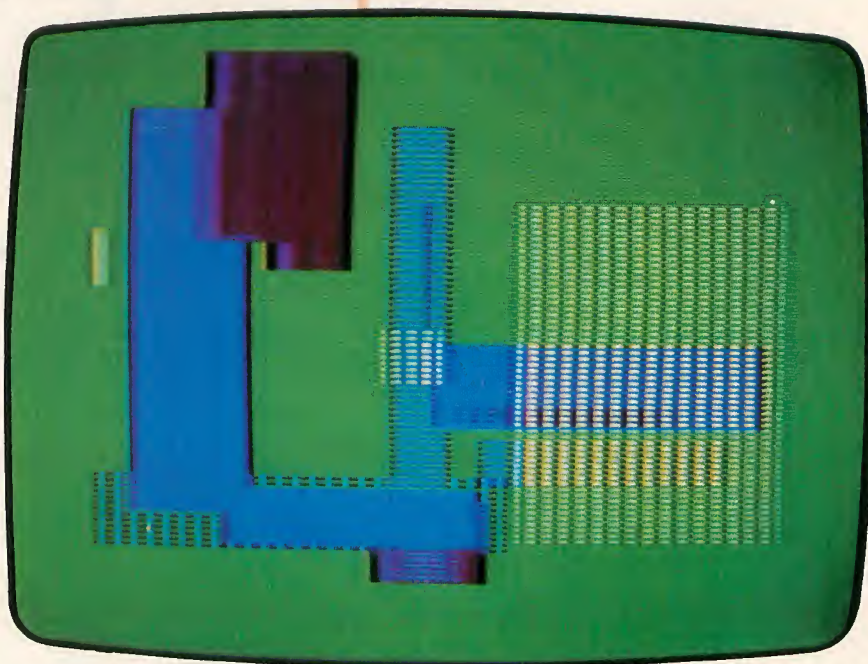
Modifications

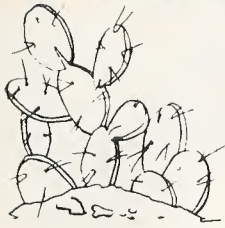
This program is easy to modify. If you change the SCREEN command in line 100 to SCREEN 1,1 you'll get cyan, magenta, and orange rectangles on a buff colored background.

If you change the PMODE 3,1 to PMODE 4,1 you can construct rectangles in the highest resolution. Before you try PMODE 4, change line 145 to read $145 C = 1$. This line change is necessary because PMODE 4 is only supposed to give two-color combinations, and the only necessary color designation for the rectangles is color number one.

Using PMODE 4,1 and SCREEN 1,0 re-

Please turn to page 67





PRICKLY-PEAR SOFTWARE

QUALITY PROGRAMS FOR YOUR COCO & TDP-100

PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.

Shaft

It took a long time, but we finally found a 100% machine language arcade game that met our standards. It had to be good, with outstanding graphics and animation. It had to be tough at high levels of play, to challenge an expert, but still have an easier level of play for the beginner or younger child. Maybe hardest of all, we didn't want another copy of some arcade game!!

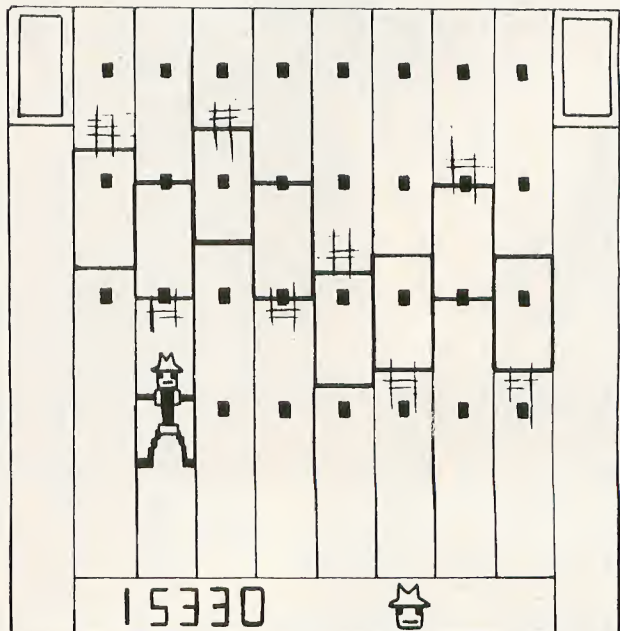
If you are tired of your friends telling you that the Pac-Mac running on their whatever brand video game or computer is better/more like the arcade than your Color Computer version, here's your chance. Show them **SHAFT**. It's new and **ORIGINAL**, and nobody has anything like it on **ANY** other computer (or in the arcades, either).

It starts with one of the most impressive title screens we've ever seen. Yes, there's full animation and sound even on the title screen!!! Then you select your level of play (on a second hi-resolution title screen) and get down to fun.

The animation is smooth and fast (it gets faster as you go along), the sound effects are great, and your man is very detailed. The whole game is done in hi-resolution, multi-color graphics, and while the game looks easy enough, it is very definitely not. In fact, we will send a gift certificate for the purchase price to the first 5 people who send us a picture of the screen showing a score over 50,000, and we will publish their names in a future ad hall of fame section!!! You have to be fast with the joystick and play several moves ahead at the same time if you expect to do well. Are you up to the challenge? **16K — \$24.95 TAPE — \$29.95 DISK**



The drawing to the right is a representation of the screen during play. The eight elevators in the center shafts move up and down in one of several random patterns. Your man starts out at the bottom left. You must maneuver him across the screen to the other side while avoiding the crushing elevators. When you reach the other side the elevator in the top right corner will come down and pick you up. It takes you up one floor, where you must repeat the process going the other way. If you make it all the way across the top floor you get a new, faster screen. The on screen scoring is across the bottom, (15,330 would be a new record for us) and next to it is a row of heads indicating how many men you have left. You start with four men, but they may not last long.



Stocked by Quality Dealers, or

Send Order To: **PRICKLY-PEAR SOFTWARE**

9822 E. Stella Road, Dept. CC
Tucson, Arizona 85730
(602) 886-1505

Your Personal check is welcome - no delay. Include \$1.50 shipping for each program ordered. (Shipping free on \$50.00 or larger orders). Az. residents add 6% sales tax. Orders shipped within two days.

Be Nice to your Fingers



Why type
when you can
just CLOAD with
the Color Computer Magazine
TAPE LOADER.

March/April . . . \$12.95
May \$12.95*
June \$12.95

Send check or money order to:

the Color Computer Magazine Tapes
Highland Mill • Camden, Maine 0484

Visa and Mastercard accepted
*CC Space Trek not included

Circle No. 46 on Reader Service Card

sults in green rectangles on a black background. A SCREEN command of 1,1 however, results in colors other than buff on black. The colors produced result in part from the horizontal starting point of the rectangle, and in part from the signal drift from the computer to the CRT.

If your computer can handle the speed-up POKE, enter line 95 to read: 95 POKE 65495,0. Don't forget to type in POKE 65494,1 to set the speed low again. *Caution — this will not work with all Color Computers.*

Conclusion

I consider this a typical short and sweet graphics program. It's easy to enter, and presents some new techniques to incorporate into other programs. ■ ■ ■

Program Listing. Rectangles

```

5 REM *****
*****
10 REM ORIGINAL PROGRAM FROM
BILL STEWART
15 REM ZOFTWARE INC., HOUSTON
, TEXAS
20 REM CREATIVE COMPUTING, JU
LY, 1981
25 REM *****
*****
30 REM MODIFIED FOR THE TRS-80 C
OLOR COMPUTER
35 REM 16K EXTENDED BA
SIC
40 REM *****
*****
45 REM BY MR. LYNN DAVIS
60 REM *****
*****
90 R=RND(-TIMER)
100 PMODE 3,1:PCLS:SCREEN 1,0
110 J=0:K=0:ZZ=0
120 A=RND(256)-1:AA=RND(192)-1
130 B=RND(256)-1:BB=RND(192)-1
140 X=RND(3):Y=RND(2)
145 C=RND(3)+1
150 Z=Z+1:IF Z>100 THEN Z=0:PCLS

160 ZZ=Z-INT(Z/2)*2
170 FOR J=A TO B STEP ((A>B)*2+1)
)*X
180 FOR K=AA TO BB STEP ((AA>BB)
*2+1)*Y
190 ON ZZ GOTO 200:PRESET (J,K,C)
):GOTO 210
200 PSET(J,K,C)
210 NEXT K,J:GOTO 120

```



PETROCCI FREELANCE ASSOCIATES

651 N. Houghton Rd
Tucson, AZ 85748
602-296-1041

Stagecoach

Enter the Wild West Days as you try to carry gold across the desert in a stagecoach. Hot in pursuit are the James Gang and of course, Indians!! To make matters worse you are responsible for the safe journey of Annabelle, the judge's daughter. Hi-Res graphic screen plots your progress. Lots of fun surprises await you in this game -shootouts, kidnappings and more. Don't miss the fun!

16 K Extended \$19.95

Inspector CLUEseau

Sherlock Holmes/Agatha Christie fans-It's finally here—A murder mystery game for the 80-C! Mr. Goodbody has been killed in his mansion and you must solve the mystery. WHO committed the murder, WHERE did it occur and HOW was it done! Question suspects, find the secret passage, and break the code to get clues. Hi-Res graphics enhances this excellent game. The computer records the clues you obtain on a clue inventory screen and also provides suspect descriptions at the touch of a finger. A fast, fun game that will sharpen your deductive skills. Every game is different!

32K Extended \$19.95

Stress Evaluator

Assess your present level of stress and how it affects your potential for illness. Evaluate the amount of life change you can effectively handle in the future. The Stress Evaluator is a valuable tool for recognizing, measuring and managing stress. The program also provides a Coping Ability Test which shows your ability to handle stress in general. Provides goal setting exercises and meditation graphic screens to help achieve stress-alleviating goals. All results output to printer.

16K Extended \$24.95

Weather Watch

If you **really** care about the weather, this program is for you. Three programs provide you with National Weather Service approved statistics in a monthly report format. Input of daily high and low temp. and rainfall outputs a report of monthly average temps. and range; high and low averages; high and low temp. for month; total rainfall; days rain > .1 in.; heating and cooling degree days; days high > 90; days low < 32; days low temp. < 32 and > 0; days low < 0; day of highest range. Also retrieves a single day from data file for review. All data outputs to printer. Well documented.

16K Extended \$24.95

Forecaster & Weather Watch (Disk)

Forecast general weather conditions with 80% accuracy with this fun, simple to use program. Although not meant to replace National Weather Service forecasts, this program is informative and enjoyable to use. You can even create your own weather by setting the variables!! Provides general forecast including precipitation probabilities. Includes Weather Watch program also all on one easy to use disk.

32K Extended Disk \$49.95

Include \$1.50 for handling for each program.

Az. Residents add 6% Sales Tax.

Quantity Discounts to Dealers.

CIS subscribers contact through EMAIL 70435,754

PROGRAM DEVELOPMENT: Computer Software
Documentation / Graphics / Consultation



16K Color Basic

Color Disassembler

More for the serious computerist's software library.

HERE'S A GOODIE for the Color Computer software toolbox. It's a disassembler that will patiently trudge through bytes and bytes of apparently meaningless machine code and reveal their true meaning. A machine-code programmer's life would be oh so easy if that could be taken literally. Unfortunately, in this context, the true meaning simply means displaying the machine code mnemonics as they would have been entered into a 6809 assembler. Some brain cell activity will still be required after this program has done its work. Naturally, a disassembler can only do so much; the rest is up to you, the clever human master of the machine.

With this utility, the task of unravelling another programmer's logic flow (assuming they were on form that day) is made vastly easier. If you're faced with what seems like half a million bytes of code, you're going to need some help. If you don't have a disassembler at your disposal, the only way to make sense of whatever code lies in memory is to look up each individual byte and cross-reference it with the 6809 manual. This is likely to drive you half-crazy — ask anyone who knows me. It's not just the risk to sanity that's the problem — the task takes forever, and the accuracy (to say the least), is very low. I've burnt the midnight oil poring over interminable memory dumps attempting it. It doesn't take long before I see reason. Too many hours can be wasted in hand-disassembling programs and (depending on the complexity of the microprocessor involved), you can save time by asking your computer's help and finish the job automatically. This fact usually dawns on me after the first half hour of drudgery by which time I'm likely to have two or three sheets of scrawled opcodes and addresses in front of me. When I realize how many more of those gruelling half hours are ahead, I'm easily convinced. It makes more sense to swallow some of those half hours writing a disassembler. It's the

by Jake Commander

result of just such a flash of inspiration that you have in front of you now. So now you can save some midnight oil.

For those of you wondering about this curious obsession with machine code, let me elucidate. Don't forget, the only thing your microprocessor can do is execute machine code. By understanding that same machine code, you have a greater understanding of the CPU — in this case, the 6809. Don't let Basic fool you; your 6809 doesn't understand Basic at all. It merely executes a machine-code program called a Basic interpreter whose function is to interpret text using machine code. If you want to understand how such an interpreter works, you have to disassemble it and work your way through the code making notes as you discern the logic. This is not an easy task with something as large as an interpreter, but can be fairly simple for a small routine such as a printer driver. (For those of you interested in the Color Computer's Extended Basic, a complete disassembly is scheduled for future issues.)

If, like me, you insist on being a hero and disassembling large programs, here are a couple of tips worth following. Try looking for breaks in the code. These usually occur at jump or return instructions. Draw a line at these points to give yourself a visual indication of where one piece of code stops and the next starts. Whenever you see a short jump, draw an arrow to the destination — this helps tie together pieces of code that appear less structured than they are. Look out for "compare" opcodes — especially CMPA and CMPB. Wherever such an instruction occurs, you can usually learn something important about the code. For instance, if you see a CMPB #\$41, you know that the program at that point is dealing with the uppercase letter A. Knowing that kind of thing gets your foot in the door

as regards a complete understanding of the code. By appreciating small facts such as these, you build your understanding of the code, and then the rest avalanches until you suddenly find you're an expert.

Don't let the sheer volume and anonymity of the code bamboozle you. It was almost certainly written by another human being so it can be understood by one. If you've never learned to brainstorm, now's your chance. Don't spend ages trying to be deadly accurate with your assessment as you note and document the function of a particular opcode. Nearly every time where a piece of code is unclear, it becomes clear by context later in the program. If you spend too much time nitpicking, you'll never get to that later point.

As for the disassembler published here, it's extremely simple to use. Enter the start and end addresses of the area you want to disassemble; the program asks if you want a printout so respond as appropriate and the process will begin. You'll get the 6809 mnemonics generated line by line. These are the mnemonics as defined by Motorola when the 6809's instruction set was designed. All addresses will be absolute as they appear in the pure machine code. Some disassemblers are capable of generating "pseudo labels" in the code to make it more like assembly language text. The value of this depends on your point of view. Myself, I prefer an unlabeled disassembly — I find unfamiliar code easier to grasp when I see numeric addresses and operands rather than labels.

Finally, bear in mind the old computer term GIGO — garbage in, garbage out. If you ask this program to disassemble something that's not machine code (such as text or data within the program), you'll see what that data would look like if it were executed by the 6809 as machine code, but it will be garbage as far as deciphering any program flow.

[illegible]

NEW

- ### Color Computer/69

Electronics Drafting Board

*6 viewing windows on a 480x540 pixel work sheet*Joystick or arrow-key control*Text labels components on-screen*All electronic symbols*Complete documentation with on-screen help*Prints finished schematic to any Epson MX (with Grafrax) or Radio Shack printer Requirements: 64K Color Computer with Extended Basic, disk drive and (optional) printer. \$39.95 includes operating manual, program on disk, postage.

DATAFILE 64k

PAINTPOT

\$24.95 on cassette. \$29.95 on disk. Both 16 & 32K on the same tape/disk. Extended Basic required.

SCREEN PRINT

\$14.95




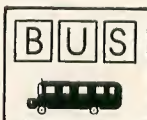
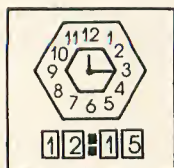
Add \$1.50 postage & handling.

Dept. C, 4653 Jeanne Mance St.,
Montreal, Quebec, Canada H2V 4J5



PARENTS!

Want to stimulate
your child's
learning? 

16K
EXT.
BASIC
REQ.

Let T.C.E. show you how!

PARENT'S TEACHING TOOLS	TAPE	DISK
ABC'S IN COLOR	19.95	24.95
BASIC MATH	14.95	19.95
COUNTING	14.95	19.95
EXT COLOR BASIC TRICKS	34.95	39.95
SEE & SPELL		34.95
TEACHING CLOCK	19.95	24.95
TEACHING MAP		34.95

T C E PROGRAMS INC.

P.O. Box 2477

Gallithersburg MD 20879 (301) 963-3848

[illegible]

```

220 LN$=LN$+" ":IFB1<16ORB1>63THENOP$=MID$(O0$,(B1 AND15)*3+1,3)ELSEX=(B1 AND48)/16:OP$=MID$(O1$(X),(B1 AND15)*4+1,4)
230 IFB1>127THEN650ELSEIFB1>63THEN610ELSEIFB1>47THEN600ELSEIFB1>31THEN310ELSEIFB1>15THEN260
240 IFOP$=" "THEN870
250 GOSUB940:GOSUB750:AD$=" "<">+HX$:GOTO880
260 ONB1-17GOTO880,880,870,870,330,330,870,880,270,870,270,880,360,360
270 IFB1=28THENOP$="ANDCC"
280 GOSUB940:GOTO300
290 GOSUB920:GOSUB800
300 GOSUB750:AD$="#">+HX$:GOTO880

```

```

310  IFPN=2THEN330ELSEOP$=RIGHT$(
OP$,3):GOSUB940:GOSUB1020
320  X=ABS(B2):GOSUB790:GOSUB750:
AD$=O$+HX$:GOSUB810:CM$=HX$:GOTO
880
330  GOSUB800:GOSUB1030
340  DC=ABS(B2):GOSUB810:GOSUB760
:AD$=O$+HX$:DC=OA+B2
350  GOSUB810:CM$=HX$:GOTO880
360  GOSUB970:GOTO880
370  GOSUB940:B1=PK:R=(PK AND96)/
32+1:IFPK>127THEN390ELSEX=PK AND
31:X=X+(X>15)*32:IFX<0THENO$="-
380  X=ABS(X):GOSUB790:GOSUB750:AD
D$=O$+HX$+"", "+R$(R):GOTO880
390  T=PK AND15:IFT=7ORT=10ORT=14
THEN870ELSEIFT=12ORT=13THENR=5
400  ONT+1GOTO410,420,430,440,450
,460,470,20,480,490,20,510,520,5
30,20,540
410  AD$="", "+R$(R)+"":GOTO880
420  AD$="", "+R$(R)+"+":GOTO550
430  AD$="", "++"-"+R$(R):GOTO880
440  AD$="", "++"--"+R$(R):GOTO550
450  AD$="", "+R$(R):GOTO550
460  AD$="B", "+R$(R):GOTO550
470  AD$="A", "+R$(R):GOTO550
480  GOSUB950:GOSUB1020:X=ABS(B2)
:GOSUB790:GOTO500
490  GOSUB800:GOSUB1030:DC=ABS(B2)
:GOSUB810
500  GOSUB750:AD$=O$+HX$+"", "+R$(R)
:GOTO550
510  AD$="D", "+R$(R):GOTO550
520  R=5:GOTO480


```

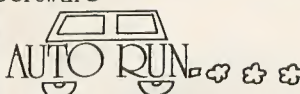
00FF00FF00FF00FF00FF00FF00FF00
FF00FF00FF00FF00FF00FF00FF00FF

F00FF00FF00FF00FF00FF00FF00FF00FF0
00FF00FF00FF00FF00FF00FF00FF00FF00F

Listing continued

Circle No. 51 on Reader Service Card

sugar  software



Auto Run is a utility program for the TRS-80[®] Extended Basic Color Computer. It is used to add convenience and professionalism to your software.

Auto Run will help you create your title screen with the graphics editor. The graphics editor allows you to choose a background color and border style. Using the arrow keys and several other commands you can draw pictures, block letters and also include text.

Auto Run will generate a machine language loader program to precede your program on the tape. Then, to start up your program, simply type CLOADM to load in the Auto Run loader program, which will then automatically start itself up, display your title screen, load your program and then RUN or EXEC it.

Also you may record a vocal or musical introduction preceding your program. The Auto Run loader will control the audio on/off.

Basic programs can be set to load anywhere in memory above \$600 (the PCLEAR 0 page).

Software authors: The Auto Run prefix may be appended to your software products.

Auto Run is **\$14.95** and includes complete documentation and an assembly source listing.
Requires 16K Extended Basic

Galactic Hangman



A great new twist to the popular, educational word guessing game for the Color Computer. Large (700 words) and sophisticated vocabulary. Or enter your own words, your child's spelling list, foreign language vocabulary, etc.

For **\$14.95** you get both the 16K and 32K versions of Galactic Hangman.



*TRS-80 is a trademark of Tandy Corp.

SUGAR SOFTWARE
2153 Leah Lane Dept. C
Reynoldsburg, Ohio 43068
(614) 861-0565

CIS orders EMAIL to 70405. 1374



Tape Information Management System

A user-oriented, easy to use personal database management system for the TRS-80® Color Computer with these outstanding features:

- * keeps files of programs, names, addresses, birthdays, recipes, class or club rosters, anything
- * variable record and field lengths
- * phrase substitution editor
- * up to 8 user-definable fields
- * ML sort (up to 3 fields), search and delete functions
- * 2 search modes — range and item
- * user-definable printer format, for any printer

For \$24.95 you get the database management system, our full documentation which includes a reference guide and a programmer's guide, and our 1981 Bibliography of articles relating to the Color Computer. Requires 16K Extended Basic. 32K recommended.

1982 TIMS Bibliography — \$9.95

Silly Syntax



A sensational and educational version of a popular party game for the TRS-80® Color Computer . . .

For 1 to 10 players. Load a story into the computer. The players are asked to supply a noun, verb, part of body, celebrity, etc. which the program uses to complete the story. The story, which is displayed when all words are entered, will be hilarious. Silly Syntax requires 16K Extended Basic (32K for disk version). For \$19.95, you get a user guide and a tape containing the Silly Syntax game and 2 stories. You can create your own stories or order story tapes from the selection below.

from the selection below:

Silly Syntax stories — Ten stories per tape.	
SS-001 - Fairy Tales	SS-004 - Current Events
SS-002 - Sing Along	SS-006 - Adventure/Sci-Fi
SS-003 - X-Rated	SS-007 - Potpourri

Each story tape is **\$9.95**. 10% off for 3 or more story tapes. Disk is **\$24.95** for Silly Syntax and 2 stories or **\$49.95** for Silly Syntax and all 62 stories.

Add \$1.00 per tape or disk for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. Dealer inquiries invited.



HARMONYCS INTRODUCES

NEW ★ MATHWAR An addition and subtraction game. The game is played by jumping one tie-fighter over another until only one is left on the screen. Each time a jump is selected a math problem must be answered. There are four selectable levels of math difficulty: Level 1—Uses numbers up to 19 but no problems are given that require carrying or borrowing. Level 2—Numbers up to 99 with no carrying or borrowing. Level 3—Numbers up to 19. Carrying and borrowing problems are given. Level 4—Numbers up to 99. Carrying and borrowing problems given. The student's interest is held by the graphics, sound and fun of this thinking game. Wrong answers do not receive a negative response from the computer. The program is FUN for young AND old.

requires 16K and EXTENDED BASIC	\$11.95
---	---------

NEW ★ PIE-CHART written by Mick Murray
PIE-CHART allows you to enter up to 20 items and display the resulting hi-resolution PIE-CHART. The data or the chart screen itself may be saved to cassette. An additional feature allows you to read the piecharts or OTHER HI-RES GRAPHICS SCREENS back in from tape and flip quickly from one screen to the next. You could save a large series of screens to tape and "flip" through them much as might be done in a slide presentation.

requires 16K and EXTENDED BASIC	\$10 95
---------------------------------------	---------

★ **DISK MONEY MINDER** permits you to set up and maintain a family budget. 32K and DISK required \$19.95

★ **MONEY MINDER II** is a cassette version of **DISK MONEY MINDER** 16K and **COLOR BASIC REQUIRED** \$14.95

★ PRESCHOOL PAK contains two preschool learning drills. Alphabet drills the preschooler in alphabet recognition. Counter drills the child in counting up to 10. They're fun!

16K and EXTENDED BASIC required	\$8.95
---------------------------------	--------

HARMONYCS

P.O. BOX 1573
SALT LAKE CITY, UTAH 84110

Circle No. 52 on Reader Service Card

Color Computer/71

The Official

FROGGER™

by SEGA®

The popular arcade game
now available for the
TRS 80® Model I & III

Now Available
for the TRS 80®
Color Computer
and the TDP 100®
\$19.95 Tape

TRS 80® Model I & III
\$19.95 Tape
\$22.95 Disk

Joystick compatible. Frogger is available
from your local software dealer or order direct.

All orders by VISA, Mastercard or
check add \$1.50 shipping. Indiana
residents please include 4% sales tax.

The Cornsoft Group

6008 N. Keystone Ave., Indianapolis, IN 46220 (317) 257-3227

Circle No. 54 on Reader Service Card

TRS 80® is a registered trademark of the Tandy Corporation.

and™ designate trademarks of Sega Enterprises, Inc.
© 1981 Sega Enterprises, Inc.



The colors shown in photo, unfortunately, are reversed.

Sea Dragon

by Jim Hurd
Adventure International
Box 3435
Longwood, FL 32750 **\$34.95 cassette**

I COULD MAKE THIS REVIEW short, simple, and to the point without spewing out a lot of words by just writing: Get this game. But that wouldn't compliment Jim Hurd enough on his fine effort.

Sea Dragon was originally written for the TRS-80 Models I and III. Versions are also available for Apple and Atari computers. Although it sometimes takes software producers longer to put out Color Computer versions of their products, the good stuff is always worth waiting for.

Let's get the explanation of the premise to Sea Dragon out of the way so that we can spend some time on its many outstanding features.

You are the pilot of a submarine and are engaged in underwater combat against all sorts of dangers. Your goal is destroy a reactor located at the end of an underwater cave. On your way you must destroy and dodge floating and an-

chored mines, cannons, depth charges deployed from battleships, and blasts from laser cannons.

Before I go any further, let me explain that I have made it to the reactor at the end, but have not yet been able to survive long enough to destroy it. So if anything happens beyond the reactor, I don't know about it yet. In the Model I and III version, after you destroy the reactor you go back to the beginning with all the action speeded up. Color Computer Sea Dragon is much more challenging than the Model I and III version, but I assume that a successful trip to the reactor will also bring you back to start.

Play Begins

The opening screen asks if you prefer to play Real Man's Sea Dragon or Quiche Eater's Sea Dragon. I recommend that you swallow a huge slice of humble pie and start off with the latter selection. Regardless of which selection you make there are seven difficulty levels to choose from.

Author Hurd and Adventure International pulled out all stops in their presentation. The game opens with a voice welcoming you aboard followed by a melody of nautical music played in four-part harmony. They didn't stop there. As

the music plays, a graphic of a sailor pumps an accordion and taps his foot. Both the accordion and tapping foot move in perfect time to the music. And they didn't stop there. Before you launch your sub you are treated to another four-part harmony, this time it's a few bars of *Popeye the Sailor*. If you get blown up, you get a few more bars of the same music played slower depicting the sadness of a downed member of the fleet. Realizing that in the heat of battle you may not want to be musically entertained, you are given the option of shutting the music off.

You have the option of joystick or keyboard control, freezing the action, and using the reset button on your computer to correct the screen colors.

Sea Dragon is not really suitable for young children. Successful maneuvering of the sub takes a good amount of coordination. If the program has any faults it's the high degree of difficulty in making a successful voyage. It's probably for that reason a practice mode is available. That's how I made it to the reactor. I must have had 50 subs shot out from under me on the way, but I did finally make it.

There is only one way to end this review, and that's by saying get this game.

— K.L. Color Staff

Softrol LSS-2

Lemons Tech.
325 N. Hwy 65
P.O. Drawer 0429
Buffalo, MO 65622
(417) 345-7643
\$19.95

ALWAYS FORGET TO PUSH the stop button on my tape recorder after loading a program. Sometimes I don't notice the play button is still down until the next day.

At first I thought nothing of it. Then I noticed that some of my older tapes weren't working reliably. Sometimes the cassette motor wouldn't turn off, other times the programs failed to load. I thought the problem was due to worn out tapes, but I was wrong.

The average tape recorder uses a small rubber pinch-roller, pressed against a metal post, to pull the magnetic tape past the recorder's play/record head. This pinch-roller/post combination is located between the playback head and the takeup reel. The takeup reel of the recorder is connected, by a pulley, to the drive motor. This system lets the takeup

reel turn quickly when the tape is close to its hub, and slowly as the tape fills up the wheel, while maintaining the same non-varying speed across the tape playback head.

The disadvantage to this system, with respect to computer systems, is that when the computer turns off the tape motor, it doesn't release the play button, which also releases the pinch roller. Since the computer turns off the motor immediately after the last bit of information is read in, and since the pinch-roller is located behind the tape head, the last portion of your program gets trapped between the pinch-roller and the metal post.

Normally, this doesn't matter because the pinch-roller is pulled back from the tape when you press the stop button. If you forget, the tape is left there until you remember. The result of such an action (or would it be inaction?), is a small impression on the tape, where it's been pressed into the rubber pinch-roller by the metal post. The next time you try to load that tape, the pinch in the tape won't make good contact with the tape head. If you forget to press the stop button enough times, the tape develops a crease directly over part of your program.

If you're unfortunate enough, your program stops loading properly.

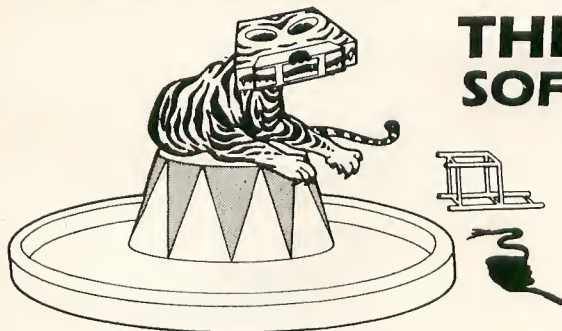
Lemons Tech. has produced a small device, called Softrol, that corrects this problem. To use it, plug the remote control jack from your computer into the Softrol box, and plug the box's plug into the remote jack of your tape recorder. Softrol now controls your tape recorder's motor. When the computer turns off the motor, Softrol takes over and lets the motor turn another few seconds, enough time for the last bit of your program to clear the pinch-roller, and escape a pinch-hit.

To help you use the box efficiently, it includes two controls: one is a slide switch that lets you choose whether you or the computer control the tape recorder; the other is a pushbutton switch to temporarily override the computer's control. In addition to these, an LED lights up whenever you press down the play button on the recorder (to remind you to press the stop button).

Besides saving your programs from accidental pinch-hits, Softrol automatically puts gaps between programs when you save them to tape.

The only difficulty I had with Softrol

Please turn to page 78



THE GREATEST SOFTWARE DEAL ON EARTH!

**Radio Shack
Color Computer
TDP
System 100**

Tame your computer without breaking your wallet's spirit! Quality programs on tape for the price of peanuts!

A subscription to **Chromasette Magazine** consists of 6 to 8 ready-to-load useful, practical, and fun programs delivered by First Class Mail every month. Programs like Curve Fit, Diggem, Graph Text, List Mod, Robot Run, House Adventure, and Keep Text.

Treat yourself to a great show — get a subscription to **Chromasette Magazine**. Or catch a single act and try a back issue. You'll be delighted by the tricks your computer will do!

The Bottom Line:	1 year (12 issues) \$50.00	Calif. residents add 6% to single copies.
	6 months (6 issues) \$30.00	North America — First Class postage included.
	Single Copies \$ 6.00	Overseas — add \$10 to subscriptions and \$1 to single copies. Sent AO rate.

The Fine Print: All issues from July 1981 available — ask for list. Programs are for the Extended BASIC model and occasionally for disks.



Chromasette MAGAZINE

P.O. Box 1087 Santa Barbara, CA 93102 (805) 963-1066 MasterCard/Visa

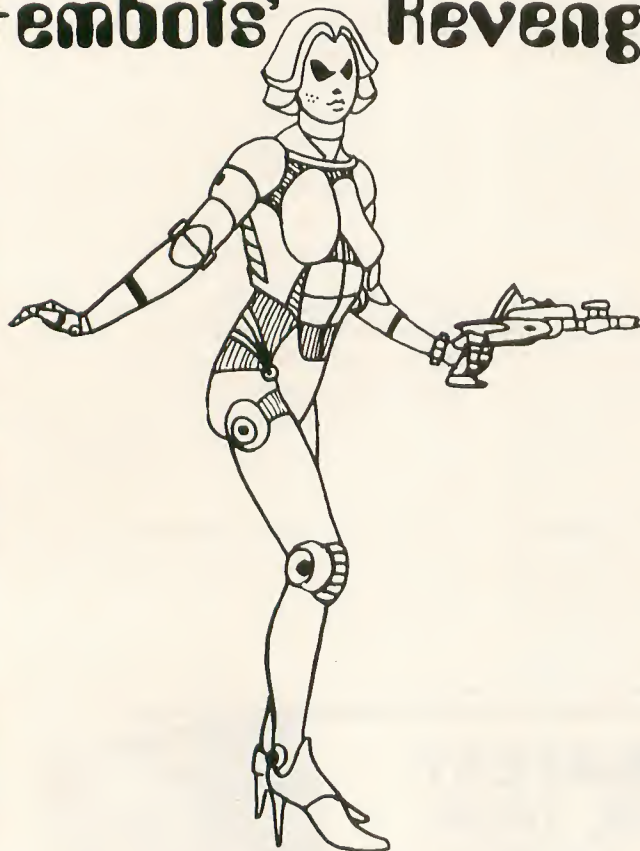
ColorQuest™

GAMES

For The TRS-80 Color
and TDP System 100

Fast Machine Code • Hi-res Color Graphics • Exciting Arcade Action and Sound

Fembots' Revenge™



3-D GRAPHIC ADVENTURE

Make love not war? Not with these sultry FEMBOTS! What a tale you'll tell IF you live to tell it! Cold steel never felt so HOT! The color and excitement of ARCADE ACTION combined with the sophistication, intellectual challenge and skill of an ADVENTURE GAME doesn't fully describe this cosmic shoot'em up.

16K Tape \$29.95

32K Disk \$34.95

BEYOND THE CIMEEON MOON™



by Kevin Herrboldt & Tim Nelson

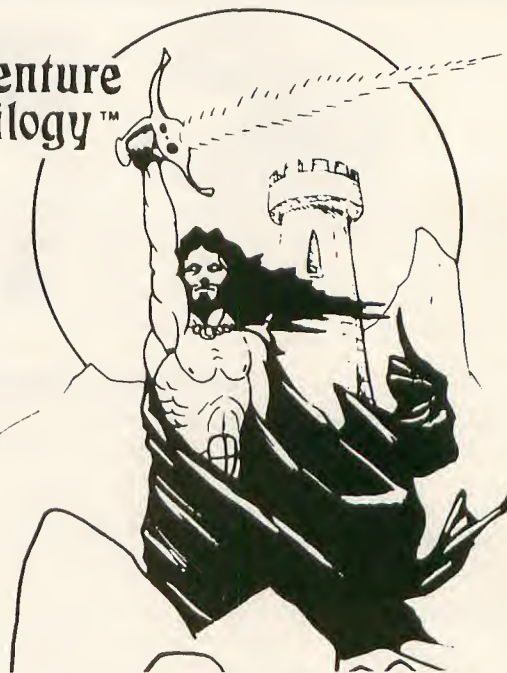
3-D GRAPHIC ADVENTURE

A dead star . . . A derlict vessel . . . or is it? Trapped within you must venture the corridors; defend yourself against the merciless gauntlet of agents of the machine mind. A real-time, high-res, 3-D science fiction adventure game of mind-blowing magnitude.

16K Tape \$24.95

32K Disk \$29.95

Adventure Trilogy™



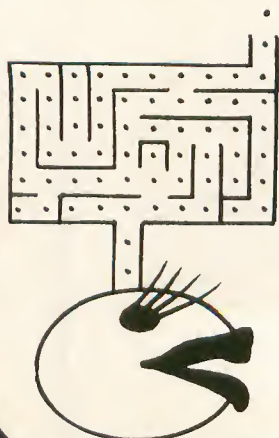
by Kevin Herrboldt & Tim Nelson

3-D GRAPHIC ADVENTURE

Clash steel with thy foe in the arena of gore. Proved worthy, go in quest of the elusive Eye of Dazmor. If ye findest the orb, hast ye the might to ward off skem and the fortitude to restore the Eye? The ultimate high-res, 3-D quest for even the most experienced adventurer!

16K Tape \$24.95

32K Disk \$29.95



MS. NIBBLER™

by Tom Czarnecki

The ONLY Ms. game around. A must for your PAC-like game collection.

16K Tape \$19.95

16K Disk \$24.95

TRS-80 is a trademark of Tandy Corp.

For Orders
ONLY Call
Toll Free

1-800-328-2737

Fast Machine Code • Hi-res Color Graphics • Exciting Arcade Action and Sound

INTERCEPTOR™

by Scott Snyder

Goes beyond "DEFENDER" and "STARGATE" to offer the most realistic ARCADE simulation possible. Warp speed action, multi-colored terrain and long-range viewer make this game tops.

16K Tape \$19.95

32K Disk \$24.95



VEGAS GAMEPAK™

by Dan Nelson

Why fly to VEGAS when you can have a casino at home! The VEGAS GAMEPAK is five action packed games with great graphics & sound. SLOT MACHINE - BLACKJACK - UP AND DOWN THE RIVER - CRAPS & KENO.

16K Tape \$19.95 16K Disk \$24.95

THE NIBBLER™



by Tom Czarnecki

Fast paced maze chase game will entertain the entire family.

16K Tape \$19.95

16K Disk \$24.95

ColorQuest™

A Division of Softlaw Corp. 612/881-2777
9072 Lyndale Ave. So., Minneapolis, MN 55420

AUTHORS' SUBMISSIONS ARE ENCOURAGED

Available at Dealers everywhere.

If you Dealer is out of stock ORDER DIRECT!



KOMET-KAZE™

by Tom Czarnecki

Shades of smartbombs and hurtling comets! Defending your planet from invasion was never so challenging. Disruptor fire is your main defense against the fierce alien attacks.

16K Tape \$19.95

32K Disk \$24.95

ORDERING



Customer service and product support call (612) 881-2777
Make checks or money orders payable to Nelson Software Systems. Personal checks allow 3 weeks.
MAIL ORDERS: \$2.00 U.S. Shipping (\$4.00 CANADA \$10 OVERSEAS) Add \$2.00 for C.O.D.
ORDERS SHIPPED SAME DAY!

COLOR-FORTH

Including SEMIGRAPHIC-8 EDITOR + UTILITIES

- Disk and Tape utilities
- Boot from disk or tape
- Graphics and Sound commands
- Printer commands
- Auto-repeat and Control keys
- Fast task multiplexing
- Unique TRACE function in kernel
- CPU CARRY FLAG accessible
- Clean INTERRUPT handling in HIGH-LEVEL FORTH
- Game of LIFE demo
- ULTRA FAST: written in assembler
- Directions included for installing optional ROM in disk controller or cartridge
- Free Basic game "RATMAZE"

Hoyt Stearns Electronics

FORTH \$58.95

4131 E. Cannon Dr. Phoenix, Arizona 85028 602-996-1717

SEND \$2.00 FOR OUR 25 PAGE CATALOGUE

Refunded with first order

THE DATAMAN

Box 431, Sta. B
Hamilton, Ontario
Canada L8L 7W2
1 416-529-1319

ALL PRICES
IN CANADIAN
DOLLARS

KEYBOARD OVERLAYS

Many programs are supplied with keyboard overlays to help you keep track of the various commands used by the program. Now you can add overlays to your own programs or to commercial programs that did not come with this feature. Die cut to fit the standard Color Computer keyboard. Dealer inquiries for blank or custom printed overlays are invited.

CAT. NO. HW002 99¢ each

COCOCOPY

This all M/L Program will copy BASIC or M/L programs including most Auto Start Programs. It will supply the beginning, ending and offset addresses and allow you to change the load address for M/L programs. I/O errors are ignored so that bad tapes can be corrected. Programs can be renamed and the motor/audio functions are controlled from the keyboard.

CAT. NO. DM004 16K Ext \$12.95

BOOKS from

SYBEX * BYTE * OSBORNE * RESTON

ADD 3% SHIPPING — MINIMUM 2⁹⁰

Circle No. 58 on Reader Service Card

COLOR COMPUTER GAMES

Machine language, multi-color high-res graphics.
16K and joysticks required.



CREATURE FEATURE



AERIAL ATTACK



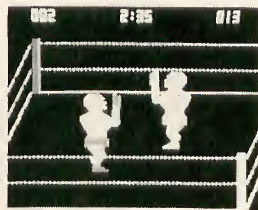
STAR TRAVELER



UFO



COLOR BLAST



BOXING

All games \$19.95 for disk and \$17.95 for cassette, postpaid.
SPECIAL: Buy any two games and select a third game free.

CHALLENGE SOFTWARE™

4247 MAKYES
SYRACUSE, NY 13215

Circle No. 59 on Reader Service Card

REVIEWS

Continued from page 75

was when I tried to use it when saving a Basic program to tape in ASCII format (with a terminal program I had used to receive the Basic program from another computer). For some reason, I could never load the program into Color Basic without an I/O ERROR message. Turning off the Softrol during the ASCII save and load solved that problem.

— by Terry Kepner

LAST MONTH WE COVERED four terminal programs for the Color Computer, this month we finish with two other programs.

Common Features and Definitions

Before describing the programs, I'm going to define and summarize some of the features shared by all the programs, which are listed in Table 1.

The table lists the program storage medium and whether the program comes on tape, disk, or ROMpak, followed by their respective retail prices. Next are the buffer sizes, depending on your computer's size.

On the Color Computer, lowercase letters are printed as reverse characters rather than true lowercase letters. This can be visually confusing when communicating with other computers using normal upper/lowercase characters. Two of the terminal programs convert any received lowercase characters to uppercase, for the video display only. So, while you'll see only uppercase letters, the buffer actually stores both sets of characters so when you send the buffer to your printer it will print the information as sent.

Three other features shared by the program are word wrap, macros, and all capitals operation. Word wrap is the software feature that prevents words at the end of a display line from being split in half. If the word length is greater than the room left on that line, the entire word drops to the next display line. Macros are another convenience feature. Any special prompts (such as the answer to the log-on questions asked by CompuServe) can be typed in ahead of time to save you money and time when you establish contact (since the phone call costs money, every second counts). This message, if used frequently, can be saved for future use. Another feature to consider is buffer/file use. All the programs will receive and transmit, and CLOAD and CSAVE Basic programs in

ASCII format, but not all of them can process machine-language programs.

Buffer control lets you stop and start data storage in your memory buffer while receiving data from the other computer, and to manipulate that data once received. When closed, incoming information appears on the screen but is not stored for printing or saving to tape or disk.

All the programs give you control over the RS-232 parameters: baud rate, parity, word size, stop bits, and duplex or half-duplex operation. Unlike parallel interfaces, which use eight data lines to transmit and receive information, the RS-232 uses only one data line. Hence, each character sent must be broken up into a series of individual bits, which the receiving computer puts back together again as a character. The baud rate is a measure of the speed with which the character is sent or received by your computer. As a crude approximation, dividing the baud rate by 10 will give you the number of characters per second being sent or received. Parity is a software method of verifying the information received and determining if the character received is actually the character that was sent (information can be distorted by the phone lines, adding or skipping bits of data). Parity can be set to odd, even, or off. If you are sending and receiving text information only, you need seven bits per character, but graphics information requires eight bits.

Stop bits are the number of bits after the word itself. You usually use only one or two stop bits. Duplex operation sends each character you type to the RS-232 and waits for the other computer to echo the character back before it displays on the video. Half-duplex operation sends each character you type to the RS-232 but doesn't check to see if the receiving computer echoes the character. Echo sends the character to the RS-232 and your video simultaneously.

DataPack and DiskPack

Cer Comp
5566 Ricochet Ave.
Las Vegas, NV 89110
(702) 452-0632

THESE TWO PROGRAMS use a special command mode to control them rather than a menu. When you're in the command mode, pressing Enter brings up a help list of the available commands.

Unlike the other program discussed this month, DataPack and DiskPack don't have an explicit command for transmit-

Table 1 — Features				
	DATAPACK	DISKPACK	COLOR CONNECTION	
Tape/Disk/ROMpak	T	D	T	D
Retail	\$24.95	\$49.95	\$29.95	\$39.95
Buffer size				
16K	14,000	10,000	7,000	?????
32K	30,000	26,000	3,000	?????
64K	n.a.	n.a.	n.a.	n.a.
Video Display	32x16	32x16	32x16	32x16
Word Wrap	Y	Y	Y	Y
Macros	N	N	Y	Y
All Caps	Y	Y	N	N
Buffer Control	Y	Y	Y	Y
File Save Load				
BASIC (ASCII)	Y	Y	Y	Y
Mach. Lan.	N	N	N	N
Data	Y	Y	Y	Y
Baud Rates Used				
110	N*	N*	N	N
300	Y	Y	Y	Y
600	Y	Y	N	N
1200	Y	Y	N	N
2400	Y	Y	N	N
4800	Y	Y	N	N
9600	Y	Y*	N	N
19200	N	N	N	N
Terminal Program features. (n.a. means not available)				
N* = —> The RS232 doesn't operate at 110 Baud, but the printer does.				
Y* = —> Only the RS232, not the printer, can operate at 9600 Baud.				

ting macros, but by loading your message before going on-line with the other computer, you can use your text buffer as a macro.

The buffer is available for your perusal at anytime, starting at the beginning and using a continuous scrolling action to display the buffer. You can stop the scroll, continue, or abort, and return to the terminal mode at any time.

As you can see from Table 1, these two programs save and load data and programs in ASCII format only. Machine-language programs cannot be loaded to, or saved from the buffer.

You can control the printer and the RS-232 baud rates. While the printer is restricted to baud rates below 9600 it does operate at 110, which the RS-232 can't.

When operating at 600 baud or faster in the terminal mode, all incoming characters are stored in a buffer and displayed on the screen when there is time to do so. At 300 baud, the information arrives slowly enough for the program to display each character as it arrives.

In addition to baud rates, you can also control the duplex operation, word length, stop bits, and parity used with the RS-232.

The disk version supports saving and loading information to and from the disk. It also supports the KILL file and DIR commands. One good feature is the abil-

ity to send a file directly from the disk to another computer, without worrying if there's enough room in memory for the entire file.

The manual is short, but adequate.

The Color Connection

Computerware
Box 668

Encinitas, CA 92024
(619) 436-3512

\$29.95 cassette
\$39.95 disk

COLOR CONNECTION IS the only terminal program that operates at only one baud rate, 300. It doesn't have a printer output mode either, although you can save ASCII files into your computer's memory and save to tape (or disk with the disk version). Once saved, the information can be loaded by Basic and sent to the printer.

Color Connection uses a series of menus to direct you through the program's operation. The main menu directs you to submenus that let you set the RS-232 parameters, load files, go to terminal (communication) mode, manipulate the buffer, or return to Basic. It also displays the amount of room left in the buffer for data storage. The RS-232 submenu, in addition to letting you set the word length, parity, and duplex operation, al-

Please turn the page

lows you to control line feed operation, to define up to four macros, put in a phone number for automatic dialing (if your modem has an autodial feature), and save these settings to tape or disk.

The buffer menu displays the buffer, saves and loads the buffer to and from tape (or disk), or types directly from the keyboard into the buffer.

Other features supplied with Color Connection are automatic repeating keys if the key is held down for more than a moment, and the use of a control key to send out all 26 control codes.

The documentation is also short, but effective.

Summary

As I said last month, the program you buy depends upon your needs more than any other single factor. No matter which one you choose, have a good time with telecommunications.



Android Attack

Spectral Associates
141 Harvard Avenue
Tacoma, WA 98466

\$21.95 cassette
\$25.95 disk

SPECTRAL ASSOCIATES obviously knows that if a new version of an old game is going to sell it had better have some new twists to it. Android Attack has a number of new features added to the game Berserk.

For those of you not familiar with Berserk, here's the setup. You are in a maze of rooms. In the rooms are a few alien androids and a treasure. You have to destroy the androids, gather the treasure, and go to the next room. The next room also has androids and treasure. The game continues until the androids get the best of you.

Your movement is controlled by the joystick. You fire at the androids by facing the direction you want to shoot at and pressing the fire button. The walls in the rooms are *deadly to you*, so stay clear.

With that as the common denominator for all Berserk-type games, Android

Attack expands the scenario to make for more action. First of all, if you have a 32K Color Computer, Android Attack offers you android speech. When you enter a room an android voice announces to its fellow androids, "Intruder alert, intruder alert." After the announcement the androids show up and the shooting begins. "Human beware," and "Coward," are few of the other pithy sayings the android lookout voice utters. The words are not all that clearly spoken, but are clear enough for you to understand what is being said. If you don't like the voice, the 16K version on the flip side of the tape is identical to the 32K version minus the voice.

Android Attack dresses your android hunter character in a protected suit. It can withstand a bit of abuse before wearing thin and exposing you to the alien atmosphere. The documentation even suggests sacrificing one layer of suit protection (there are three) if the situation warrants. Not a bad idea if you find yourself cornered.

A third extra feature, and I think the best, is the ability to make your little fellow jump and duck. By positioning your joystick just above the center of its pivot and pressing the fire button, the little guy tucks his legs and appears to jump. Place the joystick a bit below center, press the fire button, and he ducks. This is useful when trying to avoid what would otherwise be a direct hit by an android defender.

You are also awarded extra points for clearing a room of androids and making off with the treasure in extra-short time. There is a bonus-point amount posted at the bottom-right of the screen. If you successfully get out of the room you are awarded how ever many points are left on the indicator.

As with all other Berserk games, the better you do the harder the game becomes. Also, you have 16 difficulty levels to choose from (all levels get progressively more difficult as you get better) making this game a challenge for all ages.

—K.L. Color Staff

64K Disk Utilities

Spectrum Projects
93-15 86th Drive
Woodhaven, NY 11421
(212) 441-2807
\$21.95

SPECTRUM PROJECTS has produced a number of useful hardware and software items in recent months. Their new disk utilities package continues the

trend. Intended for machines modified to permit access to the *other* 32K in a bank of 64K RAMs, the disk contains three programs in four files:

- ROMcrack, for copying ROM cartridge programs onto disk;
- 40K, which makes an additional 8K of RAM available to Basic or machine language programs; and,
- Spool64, for utilizing the additional 32K as a text buffer for printing.

These may be the first programs that allow people who don't own FLEX to use the additional memory.

ROMcrack

The relocation of ROMpak programs is a popular topic among operators of disk-based systems. It's inconvenient, and potentially damaging to the computer, to frequently switch between the disk controller and other cartridges. With ROMcrack, you can make disk copies of ROM-based programs up to 8K long, without finding the start, finish, and transfer addresses associated with the code. The utility takes care of such details, and others.

This is not a trivial matter. Many ROMpak programs are written in position-dependent code, so it isn't enough to save a copy and reload it with the offset needed to put it into RAM. Some of the instructions must be changed to avoid calls to the ROMpak portion of memory between &HC000 and &HDEFF.

ROMcrack does all this, relocating the ROM code to the high bank of memory. The process requires a cassette recorder to make an intermediate copy, and goes as follows:

- Cover the leftmost finger on the card edge connector (as viewed from the end that plugs into the computer), with tape before inserting the pak. This keeps the ROM program from taking control of the machine when you apply the power. Alternatively, you can turn on the computer without the pak, defeat the "takeover" with POKE 65315,54, and carefully insert the pack while the power is on. I prefer this method, as it avoids the possibility of gunking up the cartridge connector with tape residue.

• The contents of cartridge ROM are then saved to tape with CSAVEM "ROM", &HC000, &HDEFF, &HC000. Note that the tape filename is always ROM, and an entire 8K of ROM address space is copied; in fact, some of the cartridge programs only occupy the lower 4K of this space.

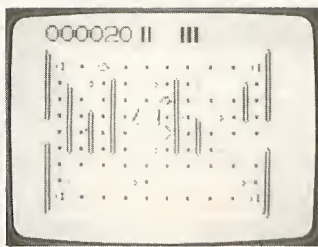
- Turn off the computer and replace the



HAYWIRE

This is Mark Data's version of Berserk.™ Super Colors and dynamite sound effects in this fast paced arcade game for one or two players. The exciting combination of angry robots and the Indestructible Menace will provide hours of action filled fun.

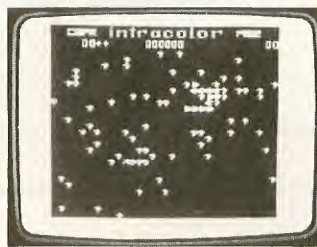
Tape \$24.95



PACDROIDS

With its space theme, the Super Saucer lays destructomines and the Super Bomb that disintegrates everything in your path, right up to the wall. The maze changes every 10,000 points as the difficulty escalates. 1-4 players. 16K extended basic.

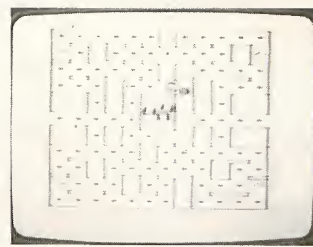
Tape \$19.95



COLORPEDE

Colorpede has a variety of bugs ranging from a tiny beetle to the gigantic colorpede. Colorpede has better graphics than Katerpillar but the sound is not as good. Colorpede also has a more varied and complicated play routine. 16K.

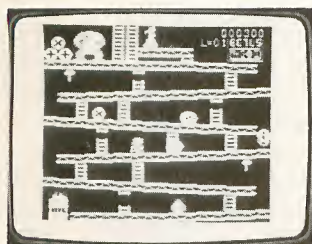
Tape \$29.95



GHOST GOBBLER

Ghost Gobbler is an excellent version of Pac-Man.™ You must gobble all the food dots while avoiding the ghosts. There are four energizer dots which will make the ghosts turn blue and become scared. This is the best copy of the arcade game. 16K.

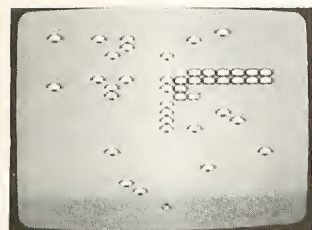
Tape \$21.95



DONKEY KING

Using the four stages from the original arcade game, with your joystick in hand try to jump the barrels, collect the pins, maneuver your way past the falling jacks, and figure out the crazy conveyor belts. Written by Tom Mix, this one's sure to become a classic! 32K.

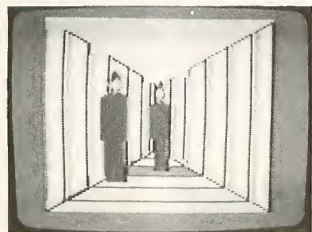
Tape...\$24.95 Disk...\$27.95



Katterpillar Attack

Modeled after the popular arcade game, Centipede. This is a well written game. It has slightly larger graphics and better sound than Colorpede. It is also simpler to play than Colorpede. 16K.

Tape...\$24.95 Disk...\$27.95



PHANTOM SLAYER

You must chase the phantoms and kill them with your assortment of weapons. This is a graphics type maze/adventure game with full screen three dimensional graphics. You are armed with a laser pistol, and proximity detector. 16K.

Tape \$19.95



GOLF

Aardvark has brought this age old game to your Color Computer. With sandtraps, trees, water holes, and a great sound track you just might mistake it for the real thing. Choose your club and select a swing, if you make it to the green, you can even putt. 16K extended color basic.

Tape \$9.95

Now you can deduct up to 20% on the price of games: buy any 2 games deduct 10%, buy any 3 games deduct 15%, buy any 4 games deduct 20% from games prices.

ZAXXON

The official DATASOFT version of the number one seller on the Softset HOT LIST. This arcade duplicate has excellent three dimensional graphics. guide a fighter plane around your enemy's missile defenses and gun batteries. Fire forward to destroy enemy positions and fuel reserves. Pilot your ship through a hole in the giant block wall but watch out for the force field!! TAPE ... 39.95

ROBOTACK

From the same people who brought you COLORPEDE comes ROBOTACK. Very good graphics with this fast action machine language program challenges even advanced players. You must fight attacking robots to defend the rest of humanity. Features firing power in all directions; full screen mobility with joystick control. Playable by 1 or 2 players. 16K. TAPE 24.95

VENTURER

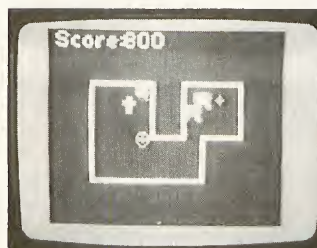
Fantastic arcade game comes to life on your Color Computer screen. Upon entering each room you'll find new treasures and new challenges. Using your joystick, get the treasure while fending off the attacking creatures. This great new adaptation by Aardvark will put excitement back into your Color Computer. 16K.

Tape \$19.95

CAVE HUNTER

With skill and technique, you must guide your hunter robot through the maze of caverns in search of treasure. But watch out, the cave is possessed with spooky creatures that'll feast upon your robot. You can destroy them by supercharging your robot with energy or just try to outrun them. Written by Mark Data. Uses Joysticks. 16K.

Tape \$24.95



COMPUTER SHACK

1691 Eason • Pontiac, Michigan 48054

Info: (313) 673-8700 • Orders: CALL TOLL FREE (800) 392-8881

Master Charge and VISA OK. Please add \$3.00 for shipping in the U.S.A. \$5.00 for Canada or Mexico. Proper postage outside of U.S.-Canada-Mexico. Dealers: We are distributors for all items in this ad. Write for our catalog and price list.

Circle No. 60 on Reader Service Card

Continued from page 80

ROMpak with the disk controller. Now, at long last, load ROMcrack. Rewind the recorder and put it in playback mode before you run it, though.

- Replace the utility disk with the disk on which the final copy is made, and run ROMcrack. It loads the ROM file from tape, asks for a new name for the disk file, and makes the recording.

The new disk program can be used with the conventional LOADM and EXEC commands, without offsets. I can vouch for ROMcrack's effectiveness in creating a disk copy of the Project Nebula game, which is known to have position-dependent code. Things went without a hitch. Likewise for Color File, which seems to be written in position-dependent fashion. I suspect that most Radio Shack cartridges can be copied, although Frank Hogg has cautioned that some of them may have self-modifying code which will make any RAM copy crash.

ROMcrack works well; the cartridge swapping required to make disk copies of your favorite ROMpak programs may be the last maneuvering you ever have to do.

It shouldn't be necessary to say that the programs you copy had better be your own! But consider it said.

40K

In its normal configuration, a 64K Color Computer uses 32K of address space for RAM and 24K for the three ROMs: Standard, Extended and Color Disk Basic. The 8K hole in the 64K address range of the eight-bit microprocessor simply isn't available. The 40K utility rectifies this situation, provided the computer has been modified to permit software access to the other 32K.

40K is a machine language program that copies the Extended Color Basic ROM to higher memory. Its original location, &H8000-&H9FFF, is subsequently decoded as belonging to RAM. The nicest part is that this memory is available to the Basic programmer! With four graphics pages reserved, PRINT MEM returns 31015, a full 8192 bytes more than normal. (Just for the record, 35623 bytes are available following a PCLEAR 1.) If a PCLEAR 0 command is simulated with the sequence POKE 25,6: NEW, the available memory tops out at 37159. These numbers compare favorably with the 33778 bytes available in Random Basic, a non-graphics dialect that runs under FLEX.

40K will be of great value to anyone who pushes the Color Computer's storage capacity. Even the most dedicated

Color Basic user, who would never dream of foregoing its convenient graphics for all the vaunted advantages of FLEX, will probably be coerced into admitting an extra 8K would be nice to have—especially at this price.

Spool64

If you do much word processing, or have another application that ties up your computer while the printer is running, you can appreciate the value of a spooler; that is, a program that dumps your text to a buffer memory to free the computer for other chores. It is a high-speed dump, and the buffer takes over feeding the printer from that point. Many products with separate memories are available for this task, but Spool64 does the job with that versatile extra bank of 32K in a modified Color Computer.

There are a couple of hitches; the printer must accept data at 1200 baud or faster, and the spooler routine will only work with Basic or machine language programs that use the output character routine already present in ROM.

To start, you enter RUN "SPOOL64" and sit back. A one-line Basic program loads and runs; it reserves some memory and calls and executes a machine-language routine which is the heart of the spooler. The OK prompt returns, and you can now enter and run your applications program. Any PRINT # -2 commands route output through the spooler. Spool64 robs you of 168 bytes of RAM when putting its hooks into the ROM routines.

Summary

This package offers something for everybody. Judicious use of ROMcrack will save wear and tear on your computer's ROM port, 40K makes life 25% more pleasant for the loquacious programmer, and Spool64 makes intelligent use of the extra memory so readily available to Color Computer users. Spectrum Projects should be congratulated for this package.

— by Scott Norman.

Doubleback

Radio Shack

One Tandy Center

Fort Worth

TX 76102

\$24.95 ROMpak

\$24.95 Data Pack

\$49.95 Disk Pack

DOUBLEBACK is a treasure hunt sort of game for one or two players.



Using your joystick, you patrol the screen waiting for objects to appear on the screen's black background. Your joystick movement leaves a green trail. The trail fades away quickly behind you, like the trail of light from Fourth of July sparklers. The idea is to encircle the various objects as they appear without colliding into them. You score points for each object encircled. If you encircle two objects at once you get extra points. Your turn ends when you hit an object.

Some of the objects are stationary, and others move around the screen. Apples and cherries stay put, while sneakers and yo-yos move making them harder to encircle. Each object has its own point value.

Good hand-eye coordination will win everytime. Doubleback is a good family game. For children it will help develop hand-eye coordination. For adults the challenge is, of course, to bank many points.

The game gets more difficult as you begin to pile on points. The yo-yo only appears after you've reached 2560 points, the pear after 5120 points, the spider after 7680, and the skull after 10,240. No points are given for encircling the skull, it's just there to harass you and make you earn such a high score.

— K.L. Color Staff

The Stripper

Spectrum Projects

93-15 86th Drive

Woodhaven, NY 11421

(212)441-2807

\$7.95

OF ALL THE NON-GAME Color Computer programs I've bought, The Stripper by Eigen Systems is by far the best! And, it only cost \$7.95! This machine language utility quickly modifies your Basic programs by deleting all REMarks, removing all extraneous spaces, and efficiently packing many program lines into fewer program lines. To get an idea of what this is all about, take a look at Figure 1.


```

10 REM SHORT TEST PROGRAM
20 CLS
30 PRINT"THIS IS A TEST OF
THE STRIPPER"
40 FOR N=1 TO 2000
50 NEXT N
60 CLS
70 PRINT"TEST IS COMPLETE"
80 END

```

The Stripper modifies this short program as follows: line 10 will be deleted, saving 15 bytes of memory. Next, the spaces in lines 30–70 will be removed, saving four more bytes. Finally, the remaining seven lines will be packed into one long line. The finished program will look like this:

```

20CLS:PRINT"THIS IS A TEST OF THE
STRIPPER":FORN=1TO2000:NEXTN:CLS:
PRINT"TEST IS COMPLETE":END

```

An eight line program has been reduced to a one liner. In this experiment, total memory savings add up to 53 bytes, a program reduction of about 40%. Another program of mine, five kilobytes long, was reduced by 20%. A note of interest: spaces you would probably not want deleted, as in STRING\$ of text, or in DATA statements, for instance, are left as is.

You can use The Stripper to perform one or two of the functions mentioned, or you can invoke all three of the main menu selections during the utility's execution. These selections are: delete REMarks, pack lines, and remove spaces. The more you modify a program, the greater the memory savings. A fourth menu selection is EXIT, which returns you to your Basic program.

Let's look at the benefits of compressing and packing Basic programs. Is there any reason besides the memory saving advantage that initially comes to mind? Yes, five or six other things happen when you shorten and condense a program. Shorter programs load faster, especially when you are using a tape system. Shorter programs mean that you can store more programs (or more SAVes of a particular program) on one tape or disk. This is important when using the Color Computer Disk System, as it stores programs in chunks of 2,304 bytes. It's not unusual to find that reducing a program's size by just a few bytes results in savings of an entire granule (2,304 bytes) of disk space.

Compressed programs run faster. Not much faster, but every little bit helps. If you don't like it when other people modify your Basic programs, The Stripper's line packing feature is just the thing for you. Packed programs are hard to edit or

fool around with. It even becomes difficult to figure out what the program author had in mind, logic-wise, when he wrote the program. If you have a long program that won't fit into your available memory, be it 4K, 16K, or whatever; you can compress sections of the program and end up with one program that will fit into your computer's memory. Or perhaps you can take the program to a friend with more memory in his computer than you have, and compress the program down to a useable size on his machine.

The Stripper is an assembly-language program that you load from tape into a protected area of memory. If you have Color Basic, load The Stripper into high memory, toward the top of your RAM (Random Access Memory). Then protect The Stripper by using the Clear command, as described in *Getting Started With Color Basic*. If you have Extended Basic, load The Stripper into high or low memory. In this case, low memory would be at graphics page one, RAM locations 1536–3071 (decimal).

The Stripper comes in a handy form to load into low memory as its machine code is exactly one graphics page long (1536 bytes). Note to disk users: Your first graphics page is at RAM locations 3584–5119. That's where you'll want to load The Stripper. Graphics page one is always a protected memory area unless you run a program that uses graphics. You will never run a Basic program and The Stripper at the same time so "always protected" is a valid statement. (OK, I know that you can PCLEAR ZERO and remove graphics page one protection with a few POKEs, but don't do that while using The Stripper.) Eigen Systems provides complete loading instructions covering all contingencies.

Once you load The Stripper, forget about it until you need it. Then, type EXEC and press Enter. Whatever was on the screen disappears and The Stripper's menu appears. The menu presents you with the four options: Delete REMarks; Pack lines; Remove spaces, and; Exit. Everytime I use The Stripper I invoke all the options. Use them in the following order: 1 — 3 — 2. Everything occurs rapidly but long programs take a minute or so to process. I have never had anything take longer than a minute and a half for a complete delete/remove/pack sequence.

When you are finished with your stripping job, press 4 and The Stripper will go away. Except for the OK prompt, the

screen will be blank. Do a LIST and your modified Basic program will scroll past. You can now SAVE the modified program. The Stripper is still lurking in memory, waiting to be called with your next EXEC command.

The only trouble I have had using this program was as a result of my programming error. In the past, I have been careless about trailing quotes as used with STRING\$. As you may have discovered, trailing quotes are not always necessary. An example:

```

10 PRINT "PRESS ANY KEY NOW
20 GOSUB 200

```

These lines will run just fine in a Basic program even though there are no quotes after NOW in line 10. The program won't run correctly when those lines are packed into this configuration:

```

10 PRINT "PRESS ANY KEY NOW:GOSUB 200

```

You may have to go through your programs and correct them if they have the missing quotes. It's easy to find them; just Run the packed program and note where it crashes! Every line that lacks quotes in pairs causes a program crash.

Another thing to keep in mind: you can't pack programs and then SAVE those programs in ASCII format as in — CSAVE "program",A — it just won't work.

Most people keep more than one copy of a program; this backup is your protection should something go wrong with your work copy. Because programs modified with The Stripper are so hard to edit, keep your backups in their original unmodified form, for future reworking.

The Stripper comes on tape. You can make as many backups as you need from the supplied master tape. To do this, load The Stripper, but don't EXECute it. Locate the START, END, and TRANSFER points by using the following keyboard commands:

```

PRINT PEEK(487)*256+PEEK(488)ENTER
PRINT PEEK(126)*256+PEEK(127)-1 ENTER
PRINT PEEK(157)*256+PEEK(158)ENTER

```

The numbers that result from following these instructions give you the memory locations you need to CSAVE copies of The Stripper or any other machine language program on tape for which START, END, and TRANSFER points are needed.

— by Tom Garcia.
Please turn the page

Silly Syntax

Sugar Software
2153 Leah Lane
Reynoldsburg, Ohio 43068
\$19.95 cassette
\$24.95 disk
\$49.95 disk with 62 stories

REMEMBER THE PARTY game Ad Libs? Sugar Software has brought it into the computer age. For those of you not familiar with the game, here's how it works.

Ad Libs are sold as a pad of games with each game being a story with words left out. In place of each missing word is a blank line. Under the line is a description of what type of word should be inserted: noun, verb, adjective, name of country, number, and so on. One person holds the game page, and without letting anyone see the story, ask each person to supply a noun, verb, or whatever. The people supplying the answers don't know the context their responses are put into. After all the blanks are filled, the person reads the complete story with the implanted words. The resulting story is usually pretty hilarious.

A typical sentence: At 5:00 I usually walk my (noun). A person is asked to supply a noun and replies "rock." The completed sentence then reads, "At 5:00 I usually walk my rock."

Silly Syntax comes complete with two stories on tape. You load them and the computer asks the questions. The number of people who can play depends upon the number of people present. If the number is less than 10, you can enter the names into the computer.

After loading the game, the computer asks parts of speech questions. The player types in the answer and presses Enter; then the next player goes, and so on down the line until the story is complete. The computer then displays the story with your responses entered in the text at the proper locations.

I played with my wife and three kids: Janis Joplin (cat), Ernie Hemmingway (cat), and Dora the dog (guess). We had to help the animals answer as they don't know a noun from a person, place, or thing. By the way, the documentation gives a quick explanation on the various parts of speech used for those who forget the difference between an adverb and an adjective.

I won't reprint the full story, but here are a couple of sentences that turned up in the games we played. "When you open the washing machine lid you will say, 'Meow.'" At the prompt we asked Janis to supply an exclamation. Later, Dora responded, "Dog dish" to the com-

puter's request for a noun. Here's how the sentence turned out, "As an added bonus you will find a prize dog dish in your very next box."

Besides the two stories that come with Silly Syntax, you can create your own by typing a story into the computer and leaving prompt spaces for the machine to solicit responses. A sentence like: "At 5:00 I walk my (n)," tells the computer to ask for a noun at that spot.

The instructions for creating your own stories are easy to follow. If that sounds like too much work, Sugar Software sells additional story tapes with topics such as Fairy Tales, Sing Along, X-Rated, Current Events, Gothic Romance, and Adventure/Sci-Fi.

Silly Syntax is a good party game. It's also a good one or two player game, provided the players aren't familiar with the story they are being prompted to write. My only real problem with it is that now whenever we come back from the grocery store, Dora rips open all the boxes looking for her prize dog dish.

—K.L. Color Staff.

Zaxxon

by Steve Bjork
Data Soft
9421 Winnetka Avenue
Chatsworth, CA 91311

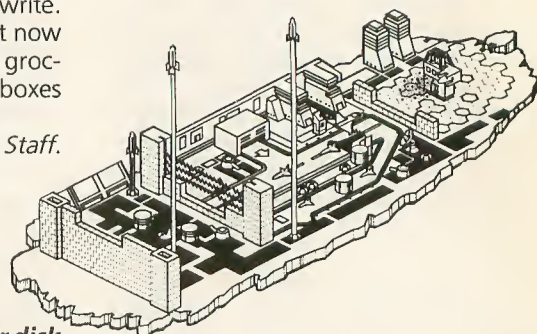
\$39.95 tape or disk

PUT AWAY YOUR QUARTERS. If you own a 32K Color Computer you no longer have to go to the video arcade to play Zaxxon. Steve Bjork, author of Radio Shack's graphic masterpiece Sands of Egypt, has written another outstanding program. Data Soft's Zaxxon is the official version, licensed to Data Soft by the Sega Enterprises, the distributors of the arcade game.



Available on cassette and disk, Zaxxon's high-resolution graphics are truly a delightful gaming experience. You are the pilot of a fighter spacecraft on a mission to destroy the deadly Zaxxon Robot. Your mission takes you across a space fortress which is guarded by enemy planes, base missiles, firing gun emplacements, radar towers, and finally, Outer Space, where you are faced with a squadron of enemy planes. Outer Space requires fast and skillful joystick reaction on your part.

You get three chances in the form of three spacecraft in Zaxxon. You are awarded an extra ship after winning your first 10,000 points. Not an easy task. You accrue points by destroying radar towers, fuel tanks, gun emplacements,



base missiles, enemy planes, robot missiles, and the evil Zaxxon Robot.

Besides the many obstacles and enemy fighters, your fuel gauge also demands your attention. If you run out of fuel, you crash. A fuel indicator at the bottom of the screen will help you keep track of your supply.

Perhaps the most frustrating aspect of Zaxxon is trying to fly through the force fields. You have to fly at the proper altitude which is a real challenge, especially during the second round when you need to make adjustments at each field.

The second space fortress is more difficult than the first. But once you succeed you've made it to your mission objective, an encounter with the Zaxxon Robot. To destroy it, you must score six direct hits on its homing missile. After destroying the robot you begin the mission again, but this time encounters with the enemy are more difficult.

Zaxxon is a real hit. Data Soft has performed a real service for Color Computer owners. The game is guaranteed to provide many hours of fun — and frustration. Zaxxon is a must for your Color Computer game library.

— Paul Kimmelman

QUALITY SOFTWARE



TDP ELECTRONICS

FOR THE COLOR COMPUTER AND TDP SYSTEM 100

— SPECIALTY —

The General. A general ledger program. Holds 100 accounts with over 500 transactions per account. 32K. **\$39.95**

Calligrapher. Great for designing custom posters, invitations, flyers or name tags. Two print fonts available, Old English and Chancery. For Line Printer VII use Disk ONLY. **\$14.95** each. Please specify print font when ordering.

Color Bonanza. 50 program package includes business, utilities, as well as arcade fun. Less than \$1.00 per program! **\$49.95**

— ARCADE FUN —

Packmaze	ML	16K	\$16.95
Bug Chase Ext.		32K	\$15.55
One or two player or robot bug against turtle.			
Donkey King		32K	\$24.95
Moon Lander		16K	\$15.95
Dancin' Devil		16K	\$14.95
War Kings		16K	\$19.95
Spider		16K	\$19.95
Cave Hunter		16K	\$24.95
Haywire		16K	\$24.95
Astro Blast		16K	\$24.95

— LITERATURE —

Assembly Language Graphics	\$14.95
Basic Computer Programming for Kids	\$14.95
TRS-80 Color Computer Graphics	\$14.95

— HARDWARE —

Grand Slam Solderless Kit	\$75.00
For E or F Board and 1.1 ROM	
Please include \$10.00 REFUNDABLE	
tool deposit with order	
For All Boards	
RAM Slam Solderless Kit	
16-32K	\$49.95
15-minute installation	
ONE YEAR WARRANTY	

— NOW AVAILABLE —

Nelson Software

Super Color Writer	T.	\$49.95
.....	D.	\$99.95
Super Color Terminal	T.	\$39.95
.....	D.	\$59.95

Intracolor Communications

Colorpede	16K	ML	T.	\$29.95
Rotoattack	16K	ML	T.	\$24.95
.....			D.	\$27.95

— EDUCATIONAL —

Speller	16K	\$16.95
Geo-Studies	16K	\$ 9.95
USA, Canada, Europe, Aust.		
Word Drill	16K	\$19.95
Math Drill	16K	\$19.95

— ADVENTURES —

Calixto Island	16K	ML	\$19.95
Black Sanctum	16K	ML	\$19.95

— UTILITIES —

Copy Cat	16K	ML	\$19.95
Color DFT	16K	ML	T. \$19.95
.....			D. \$29.95

DSL COMPUTER PRODUCTS

P.O. BOX 1113 • DEARBORN, MI 48121 • (313)582-8930

Michigan Residents Add 4% Sales Tax to Order
Please include \$1.00 for S & H
VISA & MASTERCARDS ACCEPTED

Circle No. 61 on Reader Service Card

CATCHEM

Aardvark Software
2352 S. Commerce
Walled Lake, MI 48088
(313) 669-3110

\$19.95 Cassette

CATCHEM IS AN INTERESTING game from Aardvark software. It's not a blockbuster, but is one of those quietly excellent games that give good service with a minimum of fuss and bother.

The similarity between CATCHEM and Tandy's Popcorn is startling. Both games have parallel paddles in stacks moving left to right in a horizontal plane, catching things that fall in waves from the sky. Popcorn drops only a single shape, whereas CATCHEM is a riot of shapes, colors, and odd dropping patterns.

CATCHEM grows on you as you play it. As you complete the first few waves you begin to notice the paddles are getting closer to the top of the screen, making it more difficult to catch the falling objects — a different approach to escalating difficulty. Also, the objects seem to move faster in the later portions of the game. Or maybe that's an illusion.

CATCHEM is not a 10, but it retains many of the elements essential to a perfect game. Flickerless animation and an

organized game plan are featured with imaginative use of color and shape rounding out the game. It's a good game for those moments when lasers and bug-eyed monsters won't do the trick.

CATCHEM, you're a good catch yourself.
— by Bob Liddil.

Super-Pro Keyboard

Mark Data Products
24001 Alicia Pkwy, #226
Mission Viejo, CA 92691

\$69.95

IF YOU ARE a touch typist, or have had problems with sticking or inoperative keys on your Color Computer keyboard, you're in for a fairly inexpensive treat.

I can recall having dumped 53 small copper contacts all over the floor during my first attempt to fix a bad key on my original keyboard. I said a couple of nasty things to myself, gathered up the pieces, and hoped that someday someone would remedy what I consider to be the major flaw in an otherwise excellent computer.

Now, to the rescue, the Super-Pro Keyboard. The installation procedure is well detailed and quite simple. It took me no

more than five minutes to install. The only exception to the simplicity of it all is the cutting off of the fifth post of the Color Computer's cabinet. It requires some brute force and careful handling so as not to damage the computer's case.

The keyboard has a professional feel, reacts well to the touch, and has held up to some purposeful pounding. There is no alteration of the placement or functioning of the keys. It doesn't use a three-color scheme as does the original, but that's the only difference.

The Super-Pro keyboard represents quite an improvement to my Color Computer. — P.D. Color Staff

Replacement Keyboard

Spectrum Projects
93-86th Drive
Woodhaven, NY
and
Micronix Systems
St. Charles, MO

\$89.95

IAM TIRED OF HEARING "The Color Computer is sort of like a toy, isn't it?" or, "That keyboard looks like a cheap calculator." A real typewriter-style key-

PRODUCTS FOR YOUR RADIO SHACK

NEW!

MACRO-80C

The Micro Works is pleased to announce the release of its **disk-based editor, macro assembler and monitor**, written for Color Computer by Andy Phelps. THIS IS IT — The ultimate programming tool!

The powerful 2-pass macro assembler features conditional assembly, local labels, include files and cross referenced symbol tables. MACRO-80C supports the complete Motorola 6809 instruction set in standard source format. There are no changes, constraints or shortcuts in the source language definition. Incorporating all of the features of our Rompack-based assembler (SDS80C), MACRO-80C contains many more useful instructions and pseudo-ops which aid the programmer and add power and flexibility.

The screen-oriented text editor is designed for efficient and easy editing of assembly language programs. The "Help Key" feature makes it simple and fun to learn to use the editor. As the editor requires no line numbers, you can use the arrow keys to position the cursor anywhere in the file. MACRO-80C allows global changes and moving/copying blocks of text. You can edit lines of assembly source which are longer than 32 characters.

DCBUG is a machine language monitor which allows examining and altering of memory, setting break points, etc.

The editor, assembler and monitor — as well as sample programs — come on one Radio Shack compatible disk. Extensive documentation included. Macro-80C Price: **\$99.95**

SDS80C — Our famous editor, assembler and monitor in Rompack. Complete manual included. Price: **\$89.95**

PARALLEL PRINTER INTERFACE — Serial to parallel converter allows use of all standard parallel printers. You supply printer cable. Price: **\$69.95**

MICROTEXT — Get printouts while using your modem! Also download to cassette. General purpose terminal Rompack. Price: **\$59.95**

THE MICRO WORKS

Also available: Machine language Monitor ★ 2-pass Disassembler ★ Books ★ Memory Upgrade Kits ★ Parts and Services ★ Call or write for information

P.O. BOX 1110 DEL MAR, CA 92014

619-942-2400

YOU NEED COLOR FORTH!!

Why?

- Forth is faster to program in than Basic
- Forth is easier to learn than Assembly Language
- Forth executes in less time than Basic

Forth is a highly interactive language like Basic, with structure like Pascal and execution speed close to that of Assembly Language. The Micro Works-Color Forth is a Rompack containing everything you need to run Forth on your Color Computer.

Color Forth consists of the standard FORTH Interest Group (FIG) implementation of the language plus most of FORTH-79. It has a super screen editor with split screen display. Mass storage is on cassette. Color Forth also contains a decompiler and other aids for learning the inner workings of this fascinating language. It will run on 4K, 16K, and 32K computers. Color Forth contains 10K of ROM, leaving your RAM for your programs! There are simple words to effectively use the Hi-Res Color Computer graphics, joysticks, and sound. The 112-page manual includes a glossary of the system-specific words, a full standard FIG glossary and complete source listing. COLOR FORTH ... THE BEST! From the leader in Forth, Talbot Microsystems. Price: **\$109.95**

GAMES

Star Blaster — Blast your way through an asteroid field in this action-packed Hi-Res graphics game. Available in ROMPACK; requires 16K. Price: **\$39.95**

Pac Attack — Try your hand at this challenging game by Computerware, with fantastic graphics, sound and action! Cassette requires 16K. Price: **\$24.95**

Berserk — Have fun zapping robots with this Hi-Res game by Mark Data Products. Cassette requires 16K. Price: **\$24.95**

Adventure — *Black Sanctum* and *Calixto Island* by Mark Data Products. Each cassette requires 16K. Price: **\$19.95** each.

Cave Hunter — Experience vivid colors, bizarre sounds and eerie creatures in hot pursuit as you wind your way through a cave maze in search of gold treasures. This exciting Hi-Res game by Mark Data Products requires 16K for cassette version. Price: **\$24.95**

California Residents add 6% Tax
**Master Charge/Visa and
COD Accepted**

board is now available for the Color Computer; just the thing for you touch-typists. Do you want a typewriter-style keyboard? After two years I became rather fond of the stock keyboard and was quick to defend it. I use an IBM at work, an Apple at school, and I like the Color Computer the best. Still, when I heard about the new replacement keyboard available from Spectrum Projects (and other vendors), I couldn't get my order off fast enough.

I have not seen this keyboard on any other computer. It isn't marked with any brand name nor is there a place of manufacture inscribed. I'm told it comes from Taiwan. The only markings on the assembly are BT and BT8203K; the latter alphanumeric may be the part number. The stock Color Computer, by the way, has "Made in Japan" on an inner surface. The new keyboard's US importer is The Macrotron Company of St. Louis, MO.

About 31 trace holes on the circuit board are unused, leading me to believe the board is a replacement item. The keys are nicely contoured, clearly marked, and feel smooth to the touch.

IBM keys they aren't. After trying out the board for feel, I went to a local com-

puter store and looked at several other computers. The keyboard on a VIC-20 feels most similar to this replacement board. There are two major styles of keyboard design. One is a sculptured arrangement, with a sort of dished design. On the bottom row, the keys are inclined at an angle that dishes toward the center two rows of keys, and the entire top row has an extra downward tilt. If you have difficulty visualizing this, look at the TRS-80 Model I, Model III, or an IBM Selectric II typewriter. These have a sculptured effect. So do the Tandy Model 12 and the Apple computers. On the other hand, the TRS-80 Model II, Model 16, and the Atari have a stairstep arrangement with none of the key rows tilted relative to the adjacent row or rows. This is the new keyboard's arrangement.

Total key travel of the replacement keyboard is the same as that of a Model I and less than that of a Model III. Key pressure required seems the same. The space bar does feel a little on the stiff side. These new keys have about twice the total of the stock keys. Total travel of an individual key is about 1/16 of an inch; electrical contact occurs after about 30% of total travel; i.e., you don't have to bottom the key to enter a charac-



Micronix keyboard (bottom photo) with added red plastic support, and installed (top photo).



ter. Most of the keys are a dark gray color, and the rest are black.

Installation

If you can change a fluorescent light fixture (just a little bit more tricky than a regular bulb), or put a new watch band on your wrist watch, you are talented

Please turn the page

IS PROGRAMMING YOUR COLOR COMPUTER DRIVING YOU NUTS?

MESSED-UP BY THE MANUAL?
FRUSTRATED BY FOLD-OUTS?
SEND FOR

HELP!

THE ONLY COMPLETE REFERENCE SYSTEM
FOR THE COLOR COMPUTER

HELP! is a reference book which contains every basic command for the COLOR COMPUTER. Its index lists each command, not only by what it is called, but by what it does. All of the major commands are shown with their formulas, examples, and a full set of notes explaining the various parts, uses, and pitfalls.

The BEGINNING PROGRAMMER is provided with a brief but valuable guide to programming written in English, not computerese. Each command is explained clearly, and does not require any prior knowledge of programming.

The more ADVANCED PROGRAMMER will find HELP! to be the perfect system for checking commands which are less familiar, for warnings of traps to be avoided, and for exact references to the instruction manuals.

232 pages ring-bound to lie flat on the computer.

\$9.95, plus \$1 shipping
VISA or MASTER CHARGE.

REAL SOFTWARE COMPANY—P.O. BOX 486—NORTHBORO, MA 01532 (617) 393-6281

Color Printer Interface

The CPRINT module gives your TRS-80 Color Computer a plug compatible Centronics type parallel printer port for use with all parallel Radio Shack, Epson, and similar printers. Software in on-board ROM gives transparent operation with several added features:

- All LIST and PRINT #-2 output is automatically rerouted
- Screen-print can be initiated at any time
- Line width can be set
- Graphics in LPVII can be accessed
- Page length can be set
- Blank lines can be inserted between pages

CPRINT, a fast printing parallel port, eliminates the need for a serial interface.

The CPRINT module is a fully buffered eight bit I/O port which will interface with any products which plug into the Model I/III printer port. Enclosed in a plastic case. CPRINT is available NOW for \$49.95 (less \$10 if you mention this ad), from:

Micro-Labs, Inc.

902 Pinecrest
Richardson, Texas 75080
(214) 235-0915

CHATTANOOGA CHOO CHOO SOFTWARE

Your One Stop Station
for Color Computer

Track 29

Soft Sector Marketing

Color Caterpillar,
Death Maze
\$19.95 ea.

Prickley-Pear
Software 15% off

*Vikings, Flight
\$19.95 \$16.95
PreRead 1, 2, & 3
\$24.95 \$19.95

Tom Mix Software

*Donkey King (32K)
\$24.95
Space Shuttle
\$28.95

Mark Data Products

Super Pro
Keyboard
\$69.95

*Astro Blast
Cave Hunter
and Color Berserk
\$24.95

Spectral Associates-
Trilogy

(3 games on 1 tape)
Ghost Gobbler, Cosmic
Invaders and
Space War

\$59.95 20% off \$47.95
others available
at 10% off

Planet Invasion,
Space Race
\$24.95 \$19.75

*Also available on disk (32K) at extra charge

Anteco Software
Intergalactic Force
\$24.95

Computerware
Doodle Bug
\$24.95

All programs 16K on cassette unless
otherwise stated

Datasoft

*Zaxxon (32K) \$30.95 \$35.95
*Moon Shuttle \$24.95 \$31.45

Send for free complete catalog and
descriptions!

We pay postage within the U.S.

TN residents add 6.25% sales tax

(615) 875-8656

P.O. Box 15892

Chattanooga, TN 37415



Circle No. 65 on Reader Service Card

88/June 1983

REVIEW\$

Continued from page 87

enough to do this job. In fact, you may be overqualified! The job requires no new wiring, and no soldering either. Step by step, here's what to do: unplug the computer's power cord and take the machine to your work bench. Turn the computer upside-down and put a towel or something soft under it. You'll need a medium sized Phillips screwdriver to remove the seven screws. One screw is under the warranty sticker so you might want to wait 90 days before you make this conversion. After loosening the screws, turn the computer right-side up and shake the screws from their holes. Or, before turning the machine over you could cover each screw hole with a small piece of masking tape to keep the screws in their proper place.

Lift the top half of the computer case straight up and move to the side. No wires connect the top half to the rest of the inner workings unless you have modified the computer in some way. If you have never seen the inside of the Color Computer before, you're in for an interesting experience.

It's now time to remove the stock keyboard. The unit rests on two plastic pegs, and is not screwed down in any way. The only connection to the electronics of the computer is a short 16 wire flat ribbon cable, which is only an inch or so long. This cable has a white plastic female connector at each end; one end connects to the keyboard, leave this connected. The other end of the cable plugs into a red 16 pin male connector that fastens to the center front edge of the main circuit board. Lift up the keyboard and move it around a bit, so you can get a feel for the "lay of the land," so to speak. You're now going to remove the end of the flat cable that goes to the red connector. The best way to do this is to use a small screwdriver and pry a little at a time, working on first one end of the white cable connector and then the other end. Take your time and the old keyboard will lift off in a minute or two.

Set the new keyboard onto the computer, it will rest on the same two pins that supported the stock board. Once you are satisfied that it does fit, lift it a little and bend the cable (provided with the new keyboard), so that it duplicates the original arrangement. The new cable is longer than the stock item so it's easier to hook up than the old one. Plug in the new cable, and then put everything back together in reverse order of the above instructions.

The new keyboard didn't seem to be supported as well at the bottom center

as I thought it should be. It gave a little when I pressed the space bar. I solved this problem by taking a small plastic rod (from one of my children's toys), and cutting it to the proper length with a coping saw. Then I attached it to the bottom case half with epoxy glue (see Photo).

One last piece of mechanical advice. If you have completely removed the screws from the bottom case half, pay attention to the fact that they are not all the same size. Two are shorter than the others. These two shorter screws go in the two holes closest to the front of the computer; that is, closest to the keyboard space bar. If you use the long screws in the front end of your computer, you may do some internal damage.

When I sat down to try out the new keyboard, I noticed that the contour, color, and texture of the new keys resulted in less glare than the flat stock keys. The stock keys had a shiny surface, and I consider the replacement keys a great improvement.

The keyboard slant was changed because the lower rows of keys protrude above the surface of the board to a greater degree than the back rows. This makes the overall slant of the keyboard a little flatter in its presentation to the user than the slant of the stock unit. I am not a touch-typist, but I found my speed of character entry faster with the new keyboard.

One feature of the new board that will slow you down a bit is the relocation of some of the control keys. The Clear key's new location is to the left of the space bar. The Enter key has become the Return key, and although it is still at the far right side, it has moved up one row.

Another thing you will immediately notice is the addition of four new keys labeled F-1 through F-4. Table 1 lists the CHR\$ output of these new keys. If you

Table 1.
ASCII CODES

KEY	UNSHIFTED	SHIFTED
F-1	64	freeze
F-2	189	1
F-3	103	52
F-4	4	214

want to see the CHR\$ number generated by any key on the keyboard, here is a one line program you can use:

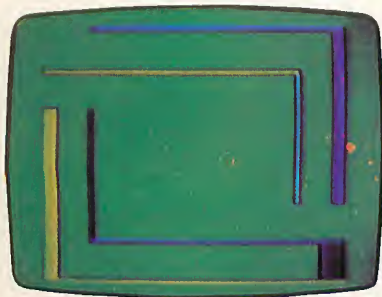
10 PRINT PEEK(135): GOTO 10

The replacement keyboard will fit all Color Computers with series B through E boards. It will not fit the new series F models nor the TDP-100 computers.

My keyboard came with a short set of installation instructions that were adequate, but no other documentation. I'm told more information will be provided in the future. Perhaps some hints as to uses for the new keys (I'm sure some of you already have thoughts as to the possibilities here).

All in all, it was worth the money and I would never return to the stock keyboard.

— by Tom Garcia



Eight Games

Programs by Mr. Bob
P.O. Box 94
Montrose, CA 91020

\$9.95–\$14.95
cassettes

EIGHT LEARNING PROGRAMS for children three to eight come from Programs by Mr. Bob; he of the title being Bob Van Ness, a child care center owner. The programs come on cassette and require 16K Extended Color Basic and joysticks. All the programs have easy to understand documentation.

After spending 12 hours with four children and these activities over a period of two weeks, I can say that Mr. Bob has turned out some material that charms, entertains, and teaches. *Create* costs \$9.95, and *Hand/Eye Coordination*, *Perception*, *Number Concepts*, *Dot to Dot*, *Addition Concepts*, and *Alphabet* all cost \$14.95. Several of the programs include Mr. Bob's recorded voice telling you how to play.

A ninth program, *Computer Literacy*, is intended to explain a bit about computing to adults; it's \$14.95.

In order of delight in my test group, the winners were clearly *Create*, *Dot to Dot*, and *Hand/Eye Coordination*. *Create* is the kind of thing a beginning programmer will come up with after learning a few things about Extended Color Basic. It's a no-win, no-lose chaotic kind of event where joysticks are used to draw screen patterns and paint them. After several games with precise instructions, the kids loved the unfettered feeling of doing as they wished with this program. *Dot to Dot* offers numbered dots to con-

nect by maneuvering the joystick. It adds colors and at times enhancements to such figures as a butterfly, a bird, and a fish.

Hand/Eye Coordination is the champ. It has 13 levels of play and involves using a joystick to guide a spaceship along a path to a hangar. Upper levels are quite challenging as the paths to travel become complex mazes. If you touch the side four times you must repeat that level.

All the other programs use the "guide the spaceship" concept to let the learner select answers. The program names describe what they teach, except for *Perception*, which teaches antonyms, and *Recognition*, which presents problems in identifying identical figures and missing parts of figures.

We found no bugs in Mr. Bob's programs and can happily report he delivers what he advertises with apparent affection for his audience.

What didn't we like? Two things.

One, in most programs a correct answer gets a reward of a colorful graphics display. Sometimes these rewards can continue up to 25 seconds. That's too much eye candy and bores the kids.

Two, Mr. Bob's recorded voice tends to be effusive as he speaks to children. Kids are leery of such gushiness and feel they're being set up for something unpleasant. "He talks like he's going to make it Christmas every five seconds," a seven year old girl said. She's rather sophisticated, so I didn't take it into great consideration.

The voice also bothered the smaller children. A three year old pointed to the screen as Mr. Bob spoke and said "No more."

"No more what?" I asked him.

"No more him!" said the child in a rising voice. We turned down the sound and had fun with the game.

Mr. Bob, forgive me for telling you this, and know that we liked your programs...

...with one exception. I can't recommend *Computer Literacy*. It's an audio-visual mix: Mr. Bob tells all about computers while the program displays well-done pictures of the monitor, computer, recorder, and joystick. We don't need pictures because we're close enough to the real items to reach out and touch them. It's art imitating readily evident reality, and the information given could be on paper. I don't think the program is viable.

But the others are.

— by Richard Ramella.

Please turn the page

Give your sensitive electronic equipment the protection it deserves!



PANAMAX surge suppressors provide the fastest response time and highest energy dissipation to eliminate damaging overvoltage "spikes and glitches." Starting at only \$59.

PANAMAX

150 Mitchell Boulevard
San Rafael, CA 94903
(415) 472-5547

outside California,
TOLL FREE 1-800-472-5555

PARENTS & TEACHERS

Software designed and written by School Owner to teach **EARLY CHILDHOOD CONCEPTS** to young children.

ECONOMY BEGINNER'S PACKAGE

... ~~\$39.85~~ ... \$30 ... save 25%

Includes the following programs:

CREATE ... Child develops creativity by drawing with one joystick & changing colors, painting & making sounds with the other. Educational & fascinating for all ages 2 to adult!

HAND/EYE ... Designed to develop coordination & concentration! Child uses Joystick to guide spaceship thru maze to hangar. Success brings new, more difficult maze-13 levels of complexity-each repeated until mastered. Challenging to all ages!

RECOGNITION ... Designed to develop recognition, memory and other early childhood skills. Child guides spaceship to correct object on screen using joystick and gets graphics reward. Several options permit adjusting complexity to suit child's ability. 2 separate motivational games, each with 3 levels of complexity and a unique memory test option that promises hours of fun and learning!

Requires 16K Ext. Basic & joysticks. Programs are in Hi-Resolution Graphics!

Operating Instructions, Trouble Shooting Tips and a catalog of our Early Childhood Software included with each order! Satisfaction guaranteed!

PROGRAMS BY MR. BOB

P.O. BOX 94
MONTROSE, CA 91020



Intracolor's Colorpede is shown above, and Computerware's Megapede top right.



with various colored enemies. Colors change as you advance from level to level. How many levels there are I don't know. I haven't even seen the stinger yet, and only know they exist because of the mention in the documentation.

Shooter movement is not limited to horizontal. You can move your shooter up, down, and diagonally. The shooter reacts very well to joystick movement no matter where the stick is. The game also operates by arrow keys using the shift key as the firing method, and features a pause ability by pressing the spacebar during play.

Katerpillar Attack

Tom Mix Software
3424 College N.E. **\$21.95 cassette**
Grand Rapids, MI 49505 **\$24.95 disk**

Tom Mix's bug shootout is also a one-player game that uses only joystick controls. Shooter movement is more restricted than in the two previously reviewed programs. Your shooter can only move one step vertically. This was probably done to more closely resemble the arcade version of the game.

The screen is set up on a green background. Once again, sound and colors are not overdone. The graphics are a bit clearer in the Mix version.

How to Decide

Which of the three is best for you will be a difficult choice. All three games are well done. Each game offers slightly different and interesting variations on the original arcade game. The easy, but more expensive way out, is to get all three. The practical way is to get one, have a friend get another, and have a third friend get the last. That way if you're at friend one's house you can play the version he has, if you're at the other friend's house you get to play his version, and when everyone's at your house you play your version. Then you can sit around and argue which game is better. You would all be right.

—K.L. Color Staff.

WE'VE ALL HEARD of the devastation to trees and shrubs due to the merciless munching of gypsy moth caterpillars. Three software producers offer you an opportunity at revenge in the form of Computerware's Megapede, Intracolor's Colorpede, and Tom Mix's Katerpillar Attack. The three games are all Color Computer adaptations of the arcade game Caterpillar. They vary slightly, but have one thing in common—they allow you to zap away at those blasted tree-eating varmints.

Proceeding in alphabetical order, we'll first take a look at Computerware's Megapede.

Megapede

Computerware
Box 668 **\$21.95 cassette**
Encinitas, CA 92024 **\$26.95 disk**

Quoting from the documentation: "You are caught in a jungle of algae. There are vicious centipedes attacking you from all sides. Killer fleas are dropping from the sky. And to top things off, a nasty spider hunts you without trying to kill you. You are armed with only your trusty laser cannon..." The only additional set-up information the excerpt doesn't mention is depicted in the packaging's graphic; you are a human in a land of giant insects.

Megapede is a one-player game with four difficulty levels: nice, ruff, foul, and mean. Mean is truly mean. In that level it seems as though the algae-dwelling nas-

ties are having a how-fast-can-you-eat-the-human contest. Pretty fast.

You are not restricted to moving horizontally across the bottom of the screen. You have the ability to move vertically and diagonally as well. One problem with the game is that joystick reaction is slow if the stick is not in the proper position. For example, if you are trying to move horizontally but the joystick is also in the downward position reaction will be sluggish. But if the stick is true in the center of the pivot, reaction is swift.

The program uses different colors for the various objects in the game. The background color is buff. Sound is constant but not overdone.

Colorpede

Intracolor Communications
P.O. Box 1035 **\$29.95 cassette**
East Lansing, MI 48823 **\$34.95 disk**

Colorpede offers the option of one- or two-player action. In two-player mode each player uses his own joystick, making quick switches unnecessary. You have five individual scoring opportunities. Toad stools are worth one point and take four shots to destroy. Poison toad stools are worth five points. The bouncing bug is worth 300, 600, or 900 points depending on how close he is to your shooter. The colorpede's head piece is worth 100 points, while body sections will only get you 10. The beetle (250 points) and the stinger (1000 points) are not common critters. The beetle appears in the second and other more advanced levels, and the stinger first appears in the fourth level.

The playing field is a black background

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at **\$199.95** complete
with Power Supply and Case!!

Tandon — Siemens — Remex — MPI — Teac

single sided 40 track — dual sided 40 track

single sided 80 track — dual sided 80 track

for

RADIO SHACK¹ — HEATH/ZENITH² — APPLE³

IBM/PC⁴-TEXAS INSTRUMENTS⁵ & MOST OTHER COMPUTERS

Drive a Hard Bargain!!™

**8 M.B. - 12M.B. with Power Supply Case, Cables & Software
Complete Systems from \$1,595.00**

**Amazing Special!-dual sided 40TK or 80TK drive with Power Supply and Case
and Our Special Warranty - Starting at \$259.95**

TOLL FREE ORDERING GENERAL AND TECHNICAL

1-800-343-8841

1-617-872-9090

Model III Internal Disk Drive Kits **\$Call**

Color Computer Drives 0123 **\$Call**

Diskettes of all sizes (Box of 10) **starting at \$20.00**

Dot Matrix Printers **\$Call**

Word Processing Printers **starting at \$899.95**

Printer Buffers 8K to 512K **starting at \$143.95**

Disk Drive Cases and Power Supplies . . . **starting at \$49.95**

DOSPLUS — 3.4 — **\$Special Price**

One Year Warranty Available on all Drives!

Dealer inquiries invited.

SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701

(617) 872-9090

TERMS:

M.C./Visa/Amex and personal
checks accepted at no extra charge.
C.O.D., please add \$3.00.

Shipping: Please call for amount.

Hours: Mon. thru Fri 10 am to 6 pm (E.S.T.)

Sat. 10 am to 5 pm

Copyright 1983 ©

1 "TANDY CORPORATION

2 "ZENITH DATA SYSTEMS

3 "APPLE COMPUTER CORP.

4 "IBM CORPORATION

5 "TEXAS INSTRUMENTS

NEW:PRODUCTS

Descriptions of new products are written from information supplied in the form of press releases and should not be taken as evaluations or recommendations of the products described. For additional information contact the manufacturer either by circling the proper number on the readers service card, or writing or calling the address provided.

Manufacturers wishing to publish an announcement are invited to send any appropriate information in *The Color Computer Magazine*, New Products editor. Announcements will be edited.

— Eds.

Nerble Force

Computerware
Box 668
4403 Manchester Avenue,
Suite 102
Encinitas, CA 92024
(619) 436-3512

Nerble Force is not just another "defenders" game. Brilliant graphics screens show you wide angle and close-up views of the city you must protect. The object is to save the people of the city from the attacking space creatures. Your ship has forward and reverse thrusters, long-range phasers, and quick maneuverability. Requires only one joystick and 16K. Available on cassette or disk.

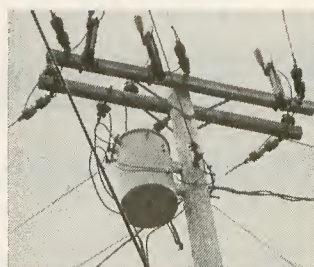
Circle No. 75 on Reader Service Card

Datafile

Ilume Design
4653 Jeanne Mance Street
Montreal, Quebec
H2V 4J5
Canada

Datafile is a sophisticated, multi-purpose data storage system flexible enough to handle any format. It can be used on 16, 32, and 64K Color Computers. It will load keyboard, tape, or disk data, and allows you to delete, sort, and print in various formats. Datafile performs string search and, in the disk version, loads data larger than your computer's RAM. Available on cassette and disk.

Circle No. 76 on Reader Service Card



Electricity Consumption Monitor

CoCoData Enterprises
1215 Emeralds Drive
Orlando, FL 32808

ECM uses text and graphic screen presentations to display Kilowatt and dollar consumption on a daily basis. High-low-average days, 20-day trend percentage analysis, and bill prediction assist the user in designing an effective energy management program.

Circle No. 78 on Reader Service Card

FILMASTR

The Computer House
Box 1051
Dubois, PA 15801
(814) 371-4658

FILMASTR is a data management system for the Color Computer. Features include custom screens with up to 20 user-definable fields, fast form fill-in with no garbage collection delays, copy fields from a previous record, full-screen editing, create sub-files, append files, user formatted printouts, and field totals.

File capacity is about 9000 characters in a 16K machine, and about 24000 characters in a 32K machine. Extended Basic is required. Available on cassette or disk.

Circle No. 79 on Reader Service Card

Modems

Universal Data Research Inc.
2457 Wehrle Drive
Buffalo, NY 14221
(716) 631-3011

Universal data announces a new complete line of modems

designed to connect to any RS-232 computer. The new modems are designed to be easy to use and reliable. The 300-baud modems provide full-and half-duplex operation in originate, answer, and auto-answer modes. The 1200-baud modems provide full-duplex operation with switch selectable local echo. The digital design is based on two LSI integrated circuits and is crystal controlled for superior performance.

Circle No. 80 on Reader Service Card



TRS-80 Color Authoring System

Radio Shack
One Tandy Center
Fort Worth, TX 76102

TRS-80 Color Authoring System (catalog #26-2714) allows educators to create instructional materials for delivery of a Color Computer without requiring the instructor to have any previous experience. The system is menu-driven, with options listed to guide the user through the lesson-creating process. Lessons consist of a series of frames which may contain tutorial text, questions, and graphics. The instructor creates these frames one at a time by filling in a form that is displayed on the screen.

Special display features of Color Author include normal and double-sized text, reverse video, underlining, bold-face and special graphics characters. Graphics can be created for frames by using joysticks and feedback messages, and hints can be set to appear after correct and incorrect responses. Available in ROMpak.

Circle No. 81 on Reader Service Card

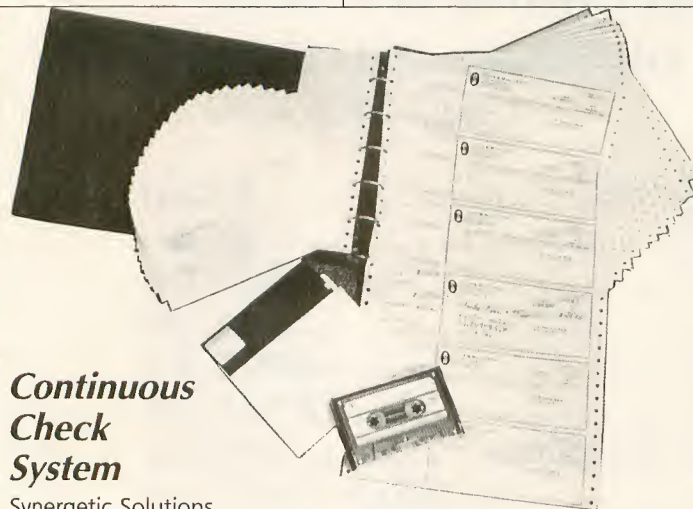
Continuous Check System

Synergetic Solutions
4715 Shepherd Road
Mulberry, FL 33860
(813) 646-6557

Synergetic Solutions offers a line of continuous fan-fold checks and accessories designed especially for home or small business use. The checks come in the universal 9 1/2 inch computer-form width, three to a page, and can be used on any 80-column printer.

To compliment these checks, Synergetic Solutions also offers a complete line of check accessories which include a data-ring checkbook and dual-windowed envelopes. Also available is Checkbook-Checkwriter II, a program which allows for the printing of single or multiple checks. The items are available either separately or as a package.

Circle No. 77 on Reader Service Card



AARDVARK

TRS-80 COLOR

COMMODORE 64

VIC-20

SINCLAIR/TIMEX

TI99



QUEST — A NEW IDEA IN ADVENTURE GAMES! Different from all the others. Quest is played on a computer generated map of Alesia. Your job is to gather men and supplies by combat, bargaining, exploration of ruins and temples and outright banditry. When your force is strong enough, you attack the Citadel of Moorlock in a life or death battle to the finish. Playable in 2 to 5 hours, this one is different every time. 16k TI99, TRS-80 Color, and Sinclair, 13K VIC-20. \$14.95 each.

32K TRS 80 COLOR Version \$24.95.

Adds a second level with dungeons and more Questing.



CATERPILLAR

O.K., the Caterpillar does look a lot like a Centipede. We have spiders, falling fleas, monsters traipsing across the screen, poison mushrooms, and a lot of other familiar stuff. COLOR 80 requires 16k and Joysticks. This is Edson's best game to date. \$19.95 for TRS 80 COLOR.



ADVENTURES!!!

The Adventures below are written in BASIC, are full featured, fast action, full plotted adventures that take 30-50 hours to play. (Adventures are interactive fantasies. It's like reading a book except that you are the main character as you give the computer, commands like "Look in the Coffin" and "Light the torch.")

Adventuring requires 16k on Sinclair, TRS-80, and TRS-80 Color. They require 8k on OSI and 13k on VIC-20. Sinclair requires extended BASIC. Now available for TI99.

Any Commodore 64.
\$14.95 Tape — \$19.95 Disk.

ESCAPE FROM MARS

(by Rodger Olsen)

This ADVENTURE takes place on the RED PLANET. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one. A good first adventure.

PYRAMID (by Rodger Olsen)

This is our most challenging ADVENTURE. It is a treasure hunt in a pyramid full of problems. Exciting and tough!

DERELICT

(by Rodger Olsen & Bob Anderson)

New winner in the toughest adventure from Aardvark sweepstakes. This one takes place on an alien ship that has been deserted for a thousand years — and is still dangerous!

Dungeons of Death — Just for the 16k TRS-80 COLOR, this is the first D&D type game good enough to qualify at Aardvark. This is serious D&D that allows 1 to 6 players to go on a Dragon Hunting, Monster Killing, Dungeon Exploring Quest. Played on an on-screen map, you get a choice of race and character (Human, Dwarf, Soldier, Wizard, etc.), a chance to grow from game to game, and a 15 page manual. At the normal price for an Adventure (\$14.95 tape, \$19.95 disk), this is a giveaway.

WIZARDS TOWER — This is very similar to Quest (see above). We added wizards, magic, dragons, and dungeons to come up with a Quest with a D&D flavor. It requires 16k extended color BASIC. \$14.95 Tape, \$19.95 Disk. VIC 20 Commodore 64.



NEW

PLANET RAIDERS — Not just another defenders copy, this is an original program good in its own right. You pilot a one man ship across a planetary surface dogfighting with alien ships and blasting ground installations while you rescue stranded troopers. Rescue all the troopers and be transported to another harder, faster battle. Joysticks required. ALL MACHINE CODE! EDSON'S BEST! 16K Tape TRS80COLOR \$19.95 — 32K Disk \$21.95.

BASIC THAT ZOOMMS!!

AT LAST AN AFFORDABLE COMPILER!

The compiler allows you to write your programs in easy BASIC and then automatically generates a machine code equivalent that runs 50 to 150 times faster.

It does have some limitations. It takes at least 8k of RAM to run the compiler and it does only support a subset of BASIC—about 20 commands including FOR, NEXT, END, GOSUB, GOTO, IF, THEN, RETURN, END, PRINT, STOP, USR (X), PEEK, POKE, *, /, +, -, >, <, =, VARIABLE NAMES A-Z, SUBSCRIPTED VARIABLES, and INTEGER NUMBERS FORM 0-64K.

TINY COMPILER is written in BASIC. It generates native, relocatable 6502 or 6809 code. It comes with a 20-page manual and can be modified or augmented by the user. \$24.95 on tape or disk for OSI, TRS-80 Color, VIC 20, or Commodore 64.

SEAWOLFE — ALL MACHINE CODE In this high speed arcade game, you lay out patterns of torpedoes ahead of the attacking PT boats. Requires Joysticks, at least 13k RAM, and fast reflexes. Lots of Color and Sound. A fun game. Tape or Disk for Vic20, Commodore 64, and TRS-80 Color.

\$14.95 Tape - \$19.95 Disk.

Dealers — We have the best deal going for you. Good discounts, exchange programs, and factory support. Send for Dealer Information.

Authors — Aardvark pays the highest commissions in the industry and gives programs the widest possible advertising coverage. Send a Self Addressed Stamped Envelope for our Authors Information Package.

Adventures and Quest now available for TI99

Please specify system on all orders

ALSO FROM AARDVARK — This is only a partial list of what we carry. We have a lot of other games (particularly for the TRS-80 Color and OSI), business programs, blank tapes and disks and hardware. Send \$1.00 for our complete catalog.

AARDVARK

2352 S. Commerce, Walled Lake, MI 48088 / (313) 669-3110

Phone Orders Accepted 8:00 a.m. to 4:00 p.m. EST. Mon.-Fri.

\$2.00 shipping on each order



Circle No. 69 on Reader Service Card

NEW:PRODUCT\$



Grand Prix

Computerware
Box 668
4404 Manchester Avenue,
Suite 102
Encinitas, CA 92024
(619) 436-3512

Speed, skill, and total concentration describe the super action of Grand Prix. You race against the clock using your joystick to control steering and speed, as you compete in the Morocco Grand Prix. This game's colorful graphics, realistic action, and great sounds provide non-violent fun to challenge the Mario Andretti in your soul. Requires 32 K and is available on cassette or disk.

Circle No. 82 on Reader Service Card

National Association of Freelance Programmers

P.O. Box 813
Vienna, VA 22180
(703) 938-1203

The National Association of Freelance Programmers announces the introduction of *Software Market Newsletter*, a monthly newsletter for NAFLP members. The newsletter provides help with software marketing information and advice. Topics include: what kind of software is in demand how and where to sell programs, and how to get freelance programming contracts.

A special features of each newsletter is a complete directory of software buyers. The directory is updates monthly and includes information about what kinds of software the buyers seek, fees offered, terms and

conditions, and how to contact the buyers.
Circle No. 83 on Reader Service Card

Introduction to Data Communications

Computerware
Box 668
4403 Manchester Avenue,
Suite 102
Encinitas, CA 92024
(619) 436-3512

Computerware's *Introduction to Data Communications* is a tutorial for beginners and hobbyists. It will familiarize you with the fundamental concepts and technical jargon of microcomputer data communications (using Color Computer examples). The lessons are organized into four parts, and includes a test at the end. Some of the topics covered include: RS-232, analog and digital, the DB-25 connector, full and half duplex, baud and BPS, synchronous and asynchronous data, types of

modulation, telephone line frequencies and levels, direct-connect modems and acoustic couplers. This introduction will explain these terms, diagram them with graphics, and also includes a glossary. Requires 16K and is available on cassette or disk.

Circle No. 84 on Reader Service Card

Geography Pac

Spectral Associates
141 Harvard Avenue
Tacoma, WA 98466
(206) 565-8453

Geography Pac is an enjoyable way to learn world or U.S. geography. It is a collection of five 16K Extended Basic programs using sounds and colors with machine-language subroutines designed to teach the topological location of countries (or states), their capitals, largest non-capital city, major industry, and currency (or statehood date). A four-color high-resolution map is used, and answer study sheets are included.

Advertiser's Index

Advertisers	Page	RS No.	Advertisers	Page	RS No.
Aardvark	93	69	Lighthouse Data	38	25
Adventure International	IV	72	Mark Data	31	20
Armadillo	39	27	Micronix	35	22
Basic Technology	61	43	Micro Works	86	62
Bertamax	18	12	Morton Bay	51	35
Better Software	28	17	Nelson Software	20-21	13
Challenge Software	78	59		76-77	56
Chattanooga Choo Choo Software	88	65	Panamax	89	66
Chromasette Magazine	75	55	Platinum Software	95	70
Cognitec	5	4	Prickley Pear Software	65	45
Color Computer Magazine Load Tapes	66	46	Program Store	43	28
Color Software Services	63	44	Programs by Mr. Bob	89	67
Colorware Inc.	24-25	15	Quasar Animations	11	8
Command Software	72	53	Radio Shack	48-49	31
Computer Shack	81	60		III	71
Computerware	7	6	Real Software	29	18
Dataman	78	58		87	63
D.S.L. Computer Products	85	61	S & N	53	39
Eigen Systems	57	40	S & S Arcade Supplies	44	29
80 Plus	53	38	Soft City	14	10
Follett	23	14	Software Support	91	68
Harmony Books	45	30	Spectral Associates	15	11
Harmonycs	52	37	Spectrum Projects	3	3
	71	52		37	23
Homebase Computer Systems	50	33	Star Kits	50	32
Hoyt Stearns	78	57	Sugar Software	71	51
Ilume Design	70	49	Synapse	9	7
Inter + Action	34	21	T.C.E.	70	50
International Color Computer Club	38	24	T & D Software	52	36
International Software	61	42	Tom Mix Software	27	16
Intracolor Communications	13	9	Zeta Computer	51	34
Leading Edge	II	1			

Available on disk or cassette.
Circle No. 85 on Reader Service Card

Bloc Head

Computerware
Box 668
4403 Manchester Avenue,
Suite 102
Encinitas, CA 92024
(619) 436-3512

The pyramids of brightly colored cubes would be a

simple challenge for your little Bloc Head if it weren't for the despicable characters after him, who try to push him off the cubes before he can change their colored surfaces. Bloc Head must dodge the sinister springs, bad eggs, and other evils. Bloc Head features brilliant graphics, delightful sounds, and different levels of difficulty, offering non-violent fun for all. Requires 16K. Available on cassette or disk.

Circle No. 86 on Reader Service Card

Bulletin Board Service

A new BBS for the Color Computer, located in Georgia, is now in operation. The BBS, called Kaleidoscope, operates 24 hours a day. Sysop is Willie Bethay. The phone number is (912) 923-4679.

Circle No. 87 on Reader Service Card

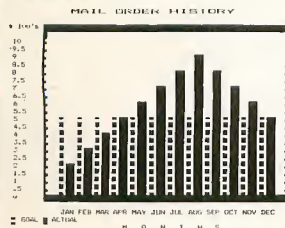


Moon Hopper

Computerware
Box 668
4403 Manchester Avenue,
Suite 102
Encinitas, CA 92024
(619) 436-3512

You were out on test maneuvers in the new exploration vehicle (Moon Hopper) when a swarm of traglons attacked. You (in your Moon Hopper) must reach the Moon Base. Your Moon Hopper can roll over the surface, hop over obstacles, and is equipped with the latest phaser equipment. High scores are recorded on a 3-D graphics display. Moon Hopper requires 32K and is available on cassette or disk.

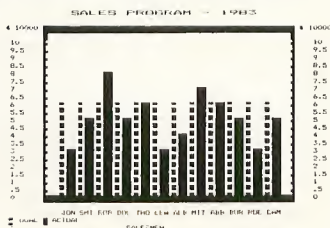
Circle No. 89 on Reader Service Card



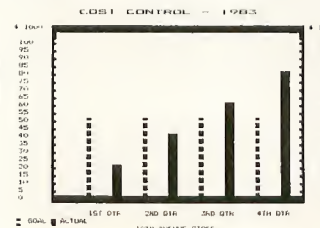
KWIKGRAF

West Bay Company
Route 1, Box 666
White Stone, VA 22578

KWIKGRAF, a second



generation program, integrates the Color Computer and Epson MX-80 printer to produce superb camera ready bargraphs in approximately three minutes time. The program is modular in nature,



giving screened instructions and permitting rapid keyboard changes of data and design. The listing can be altered for even more extensive changes. Available on cassette.

Circle No. 88 on Reader Service Card

"It should have been incorporated into the original MICROSOFT programming..." Color Computer News

The Platinum Worksaver®

...Programming Made Easy

FULL SCREEN EDITING OF BASIC PROGRAMS

With the PLATINUM WORKSAVER's editor, there's no more counting the numbers of characters to delete or change, or wondering if you deleted too many or too few. You see the whole line as it's edited. Changes, deletes and inserts are automatic and the cursor can be moved anywhere on the screen.

FULL SCREEN EDITING OF NUMERIC AND STRING ARRAYS

But that's only the beginning! The editor (Written in machine language) also comes with a short, two line BASIC subroutine that will allow you to use the full screen editor on your numeric and string arrays. This is the springboard you need for developing your own VisiCalc™ or word processor.

NUMERIC KEYPAD

We've solved another Color Computer weakness. Press a control key and letters J, K, L, U, I, O, P become number keys 1-7. Numbers 8-0 remain in their normal positions. The key pad numbers are clearly labeled on the overlay.

COLOR COMPUTER* UPGRADE

With the Platinum Worksaver®, programming time and hassle can be cut by 50%.

SINGLE KEY ENTRIES OF BASIC WORDS

So, the PLATINUM WORKSAVER makes it easier to write useful programs and edit them, but that's not all! Entering programs is a breeze with single entry of over 80 basic words, on a beautifully designed KEYBOARD OVERLAY, color-keyed to function. No need to memorize or consult a conversion chart to find a word.

PROGRAM CHAINING AND DYNAMIC DEBUGGING

Now you can write, enter and change programs easily, but what about debugging? This is the frustrating, time consuming aspect of programming and frankly, the Color Computer doesn't help you much... you have to start the program over each time you make a change. But not with the PLATINUM WORKSAVER!! With it you can change, delete, add and rearrange or join lines. The special reserved key is excellent for copying or moving parts of lines to other lines... plus, you can even LOAD A WHOLE NEW PROGRAM without disturbing the data you've created.

A COLOR COMPUTER* MACHINE LANGUAGE ENHANCEMENT PACKAGE THAT PROVIDES:

- Dynamic full screen editing of BASIC programs.
- Dynamic full screen editing of numeric and string arrays. The advanced user will be able to write VisiCalc™, word processor etc.!
- Single key entries for 80 commands and functions.
- Functionally laid out plastic keyboard overlay.
- Numeric Keypad conversion.
- Automatic line numbering.
- Best value per dollar than any other enhancement package available.

THE PLATINUM WORKSAVER INCLUDES:

- Enhancement program, including a sample mini-word processor, on a high-quality Agfa Cassette.
- Fully labeled acetate keyboard overlay
- Complete instructions
- Loads in seconds, takes 2.2K

The PLATINUM WORKSAVER costs \$35.00 plus \$3.00 S&H (NY residents add tax). To order write:

PLATINUM SOFTWARE
P.O. Box 833
Plattsburgh, N.Y. 12901
Phone orders: (518) 643-2650

VISA, MASTERCARD ACCEPTED PERSONAL CHECKS TAKE 2-3 WEEKS TO PROCESS

platinum software

You're Serious About
Your Color Computer?
SO ARE WE.

C.
C.
U
P
G
R
A
D
E

*Color Computer & TRS-80 are registered trademarks of Tandy Corp.

OVER 100 PROGRAMMABLE KEYS

LOADS TO DISK

16K MIN. REQ.

Circle No. 70 on Reader Service Card

Color Computer/95

END OF FILE



ore than 90 percent of the articles in **The Color Computer Magazine** are sent in by our readers. Most of you are not professional writers, or even aspire to become writers. That is where the fun of creating this magazine each month comes in.

We get to work with people sharing a common interest in the advent of personal high technology. **The Color Computer Magazine** is a forum for users to share their programming creations and other Color Computer information.

I guide the magazine as a Sysop guides his bulletin board, or as a Users Group president presides over his organization. The trick is to not only listen to what users want and provide it, but also to anticipate wants and needs.

We get many manuscripts each week. Choosing which to publish is never easy. You're an innovative lot. But choose we must, and choose we do. We pay a lot of attention to your letters when deciding what to accept and eventually publish in the magazine.

Prompted by Kathleen Gill's excellent article on writing documentation, and realizing that many of you would indeed try to publish an article if you only knew how to go about it, what follows are a few excerpts from our Writer's Guidelines.

You've just developed a new application for your Color Computer. The first step in converting that new program into a magazine article is to determine if there is a need for it. Have you done a good job debugging it? Is your program different from, or an improvement on, others already published? If you answered "yes" to both questions you probably have something we'd be interested in considering.

As Kathleen wrote in her article, consider your article to be your program's, or project's, documentation. You spend days, weeks, and sometimes months developing a program. Don't sell yourself short by cranking out its documentation in only two hours. Think back on some of your own frustrating moments of trying to run a program from a manual that read like it was produced using a random word generator program. Take your time, look at articles published in previous issues, and then just sit down and write.

Prepare your article double-spaced on non-erasable bond. With fanfold paper, separate the pages and tear off the tractor feed edges.

Never submit your manuscript to more than one magazine at a time. That bears repeating. Never submit your manuscript to more than one magazine at a time.

Always keep a copy of your manuscript in your files. Don't send us your only copy. We are as careful with your work as we are with our own, but we are not perfect (yet). All manuscripts should be accompanied by a SASE (self-addressed stamped envelope) with enough postage for us to return your manuscript if we decide not to buy it. Additionally, it's best to paper clip your return postage to the enclosed envelope because if we don't need to send the manuscript back your postage stamps will be returned. Always send a tape or disk of your program with the manuscript.

That's all there is to it. Of course some of you published pros know most of that already. We hope some new "pros" will now be encouraged to give article writing a try.

Now to another subject: Fort Worth, Texas. There are some awfully nice people there, and I don't just mean the folks at One Tandy Center. Fort Worth is a nice city. There

are many old west historical sites to see, museums, rodeos, and other charms to the place.

Since the birth of **The Color Computer Magazine** we have gone to Fort Worth a few times. Each time we find something we missed the previous time out. But one place we visit everytime we're in town is a place called the Pickin' Parlor.

The Pickin' Parlor is located in a section of the city called the Stockyards. It's the preserved old west area. The Pickin' Parlor is large for a bar, small for a nightclub, and just right as a cross between the two. There's room enough on the dancefloor to accommodate at least 25 two-stepping couples. The band sets up on a stage so all can see and hear them, and they can see the people.

It was the music we heard walking along Exchange Street that drew us into the Pickin' Parlor, and as a matter of fact, it's the music that takes us back everytime we go to Fort Worth. Tuesday through Sunday the band on the stage is called Hill City. They're a talented group of people capable of handling a music ranging from hard driving rock to sweet country ballads. No matter what song they're playing it all sounds like tunes from Texas. If there are any record producers among our readers take note.

Last time we were in Fort Worth, James Povec and I came up with an idea — to show you Fort Worth, Hill City Band and all. We talked to Tandy and they liked the idea, we spoke with the band and they liked the idea. We even spoke to Mayor of the Stockyards, Steve Murrin, who also liked it. So what we're going to do is (since we can't bring Fort Worth to you) give you a good reason to go to Fort Worth.

Although the event is early in its planning stages we want to tell you now so that you will have plenty of time to make vacation plans. Sometime next spring **The Color Computer Magazine** will host the TRS-80 Color Expo. You'll get to meet some of the people at Tandy, visit the sites of Fort Worth, and since we all wouldn't fit inside the Pickin' Parlor we'll bring the Hill City Band to our convention.

It would be tough to come up with a better vacation for Color Computerists; a visit to the birthplace of your computer, good sightseeing, and some good ol' Texas fun (how's some hot Texas chili sound?).

— K.L. Editor

FOR NEXT (07,83)

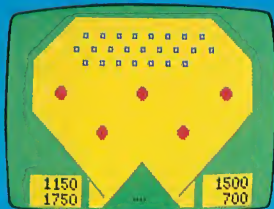
DENNIS KITSZ'S article telling you how to build a 128K bubble memory kit will be a hard act to follow. So we gathered the heartiest group of writers we could and told them to give it their best shot.

New computerists will benefit from Franklyn Miller's article explaining Color Disk Basic. One particular article that we're looking forward to publishing is how to build a Color Computer cart. This is a hardware construction article in the truest sense, using wood, nails, and varnish.

Amongst the other articles to look forward to is Richard Ramella's continuing saga of Poke and Sunflower in the second installment of The Sorcerer's Puzzles. And there's more, including Bill Barden on sound, and Jake Commander who begins a series of articles commenting the Color Computer's ROMs.

See you next month.

Radio Shack TRS-80® Color Computer Software Sale!



Pinball

Save \$7⁰⁷

22⁸⁸ Reg. 29.95
26-3052

Be a pinball wizard! Hit the circle poppers and knock-outs for points. You can even bump and tilt. For faster play, design your own customized playfield.

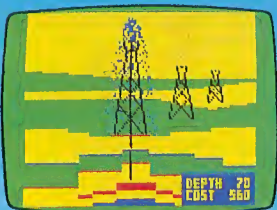


Microbes

Save \$5⁰⁷

19⁸⁸ Reg. 24.95
26-3085

You're the disinfectant shooting antibodies at the nasty bacteria. Watch out for "X factor". This sneaky enemy can zap you with its own antibodies!

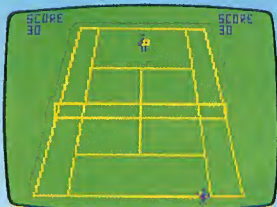


Wildcatting

Save \$10⁰⁷

19⁸⁸ Reg. 29.95
26-3067

One to four wheeler-dealers pick drilling sites and fight for the highest profits. Hit a gusher and you're in the money. But tap a dry hole and you're drained!



Tennis

Save \$10⁰⁷

19⁸⁸ Reg. 29.95
26-3080

Test your tennis skill against a real pro—your Color Computer! Or play another person. Realistic matches demand quick reflexes and concentration.

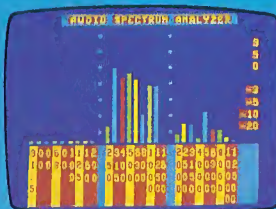


Art Gallery

Save \$10⁰⁷

29⁸⁸ Reg. 39.95
26-3061

Create landscapes, still lifes, cartoons—whatever suits your artistic fancy! Special graphics features let you accurately control your drawing.

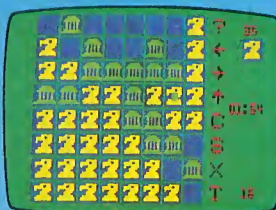


Audio Spectrum Analyzer

New Low Price!

14⁹⁵ Was 19.95
In Cat. RSC-8
26-3156

Test your stereo equipment for maximum performance! Color bar graphs show the power distribution over nine full octaves in 1/3 octave segments.



Roman Checkers

Save \$5⁰⁷

24⁸⁸ Reg. 29.95
26-3071

The classic game of strategic placement—as easy to learn as checkers, but as rewarding as chess. Play against the computer at different skill levels.



Shooting Gallery

Save \$5⁰⁷

24⁸⁸ Reg. 29.95
26-3088

The carnival beckons—lights, music, the shooting gallery! Hit moving targets—owls, ducks and more—for points. Fewer shots each turn.

Radio Shack®

The biggest name in little computers®

A DIVISION OF TANDY CORPORATION

Retail prices may vary at individual stores and dealers.

Circle No. 71 on Reader Service Card

ABSOLUTELY RELENTLESS

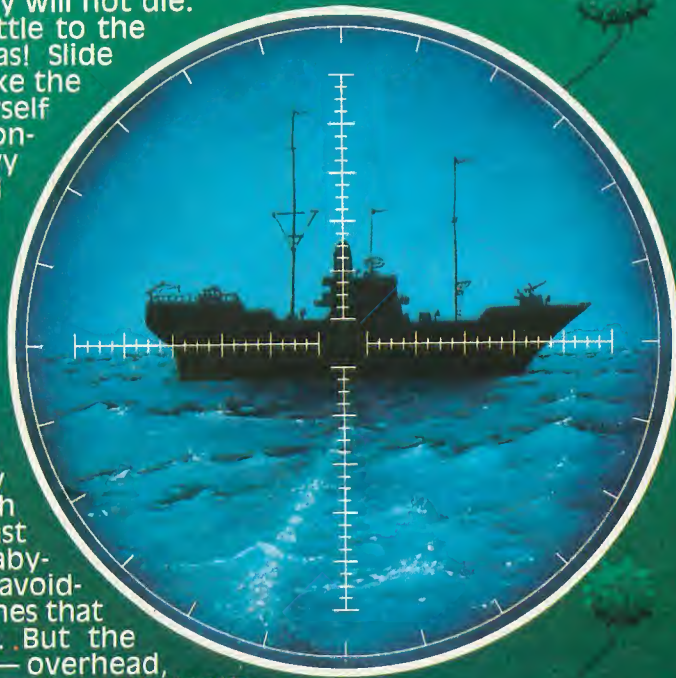
The challenge of inner space — the fury of an enemy that seemingly will not die.

This is SEA DRAGON — a battle to the death under the high seas! Slide into the Captain's chair, take the controls and prepare yourself for the most incredible non-stop action this side of Davy Jones' locker. SEA DRAGON puts you in control of a nuclear sub that's armed from stem to stern with enough firepower to take on King Neptune himself — and you'll need every missile, every torpedo, and every scrap of skill you can muster to survive.

The object of SEA DRAGON is to successfully navigate your sub through an underwater course past mountains and through labyrinthine passageways while avoiding clusters of explosive mines that rise from the seabottom. But the danger doesn't stop there — overhead, surface destroyers lace the water with depth charges; below, deadly attack bases and arcing lasers cut a killing swath that could reduce your sub to bubbling slag. But even these potentially lethal perils are dwarfed by the awesome menace that awaits you at the course's end.

SEA DRAGON — every possible "extra" is here to ensure your playing pleasure: exciting sounds, high score save, machine language graphics and an eye-popping scrolling seascape that extends the equivalent of over two dozen screens placed end-to-end, providing a diverse and unique challenge that will not diminish after repeated playings.

Nothing you've ever seen on your micro could possibly prepare you for this! You are ready now, ready for the ultimate in undersea action with a pace that is absolutely unyielding. SEA DRAGON — the arcade has finally come home.



FOR THE **APPLE** by John Anderson



FOR THE **ATARI** by Russ Wetmore



FOR THE **TRS-80** by Wayne Westmoreland & Terry Gilman



**ALL VERSIONS
ARE
JOYSTICK
COMPATIBLE!**



SEA DRAGON FEATURES

- Fantastic Scrolling Seascape
- Nearly Limitless Game Challenge
- High Score Save (disk version)
- Terrific Sound Effects
- Arcade Action Graphics™
- Apple version "talks" without special hardware!



**NOW FOR
THE
COLOR
COMPUTER!**

Adventure
INTERNATIONAL
A DIVISION OF SCOTT ADAMS, INC.
PRICES SUBJECT TO CHANGE

To order, see your local dealer. If he does not have the program, then call 1-800-327-7172 (orders only please) or write for our free catalog.

Published by ADVENTURE INTERNATIONAL
a subsidiary of Scott Adams, Inc.
BOX 3435 • LONGWOOD, FL 32750 • (305) 830-8194

Circle No. 72 on Reader Service Card